

*H. P. Anderson  
York, Pa.*

# OPERATORS MANUAL AND PARTS CATALOG

## ONAN ELECTRIC GENERATING PLANTS MDJE SERIES

968-325

6A870

| MODEL<br>DETAILS                    | Fuel Filter<br>Kit                           | Impeller<br>Kit | Water Pump<br>Kit |
|-------------------------------------|--|-----------------|-------------------|
| MDJE<br>(Heat Exchanger)            | 122-0792                                     | 131-0487        | 131-0486          |
| MDJC<br>(Without<br>Heat Exchanger) | <i>INSTALL BOTH<br/>@ 530 hrs<br/>8/1/94</i> |                 |                   |
| MDJF                                |  | 131-0488        |                   |
| MDKC                                |  | 132-0334        |                   |
| MDKD                                |  | 132-0334        |                   |

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A DIVISION OF STUDEBAKER CORPORATION

~~S/N~~

MDJE 3CP/2268B

S/N 0271282311

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*new rotor +*

*Exits 9-4-73*

*Palmer Johnson dnc.*

*David Gabet.*

*711 Filter Fram PH16 or STP 16*

**ONAN  
ELECTRIC GENERATING PLANTS  
MDJE  
SERIES**

968-325

6AB70

*Antizrenze — Takes — 4 1/2 Qts  
Oil — " 3 Qts*

**PERFORMANCE  
CERTIFIED**

We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.

**ONAN** 1400 73rd AVENUE NORTH EAST  
MINNEAPOLIS, MINNESOTA 55432

A DIVISION OF STUDEBAKER CORPORATION

**IMPORTANT...RETURN WARRANTY CARD ATTACHED TO UNIT**

**THIS OPERATOR'S MANUAL PROVIDES INFORMATION FOR PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES OF YOUR ONAN UNIT. AN APPLICABLE WIRING DIAGRAM WAS ALSO INCLUDED AT TIME OF SHIPMENT. RETAIN FOR FUTURE REFERENCE!**

**WE SUGGEST THIS MATERIAL BE KEPT HANDY SO THAT IT CAN BE READILY REFERRED TO WHEN NECESSARY, EITHER FOR ORDERING PARTS OR MAKING EQUIPMENT ADJUSTMENTS.**

**FOR MAJOR REPAIR INFORMATION A SERVICE MANUAL IS AVAILABLE. IF A MAJOR SERVICE MANUAL, ADDITIONAL OPERATORS MANUAL, AND/OR WIRING DIAGRAM IS REQUIRED, CONTACT YOUR NEAREST ONAN DISTRIBUTOR. THERE WILL BE A CHARGE FOR THIS MATERIAL.**

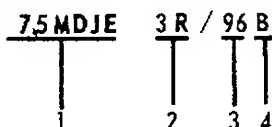
**BE SURE TO INCLUDE COMPLETE ONAN MODEL, SPEC., AND SERIAL NUMBER AS SHOWN ON ONAN NAMEPLATE ATTACHED TO UNIT. THIS IS ESSENTIAL IN FURNISHING YOU WITH THE PROPER INFORMATION.**

# GENERAL INFORMATION

## INTRODUCTION

This manual includes instructions on the installation, operation, maintenance and parts of the MDJE electric generating set. Identify your model by referring to the MODEL AND SPECIFICATION NO. as shown on the ONAN nameplate. Electrical characteristics are shown on the lower portion of the nameplate.

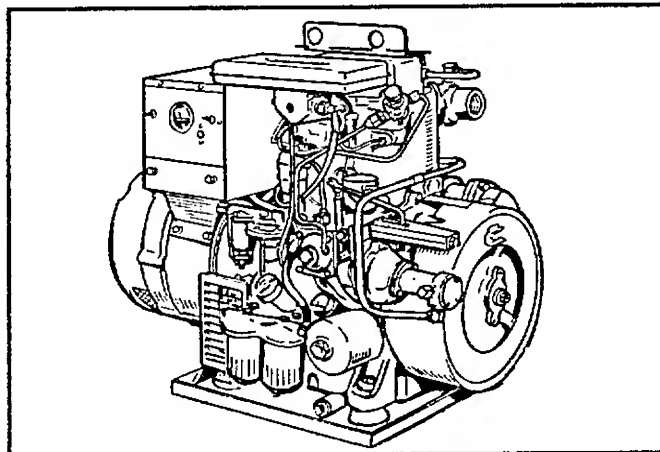
How to interpret MODEL and SPEC NO



1. Factory code for SERIES identification.
2. Combines with number 1 to identify model. Indicates model, output voltage, method of starting: E-ELECTRIC starting, R-REMOTE electric starting.
3. Factory code for designating optional equipment.
4. Specification letter. (Advances when factory makes production modifications.)

If it is necessary to contact a dealer or the factory regarding the plant, always mention the complete Model, Spec No. and Serial No., as given on the ONAN nameplate. This nameplate information is necessary to properly identify your plant among the many types manufactured. Refer to the engine nameplate when requesting information from its' manufacturer.

Electric plants are given a complete running test under various load conditions and thoroughly checked before leaving the factory. Inspect your plant closely for loose or missing parts and any damage which may have occurred in shipment. Tighten loose parts, replace missing parts and repair any damage before putting plant in operation.



TYPICAL MODEL MDJE

## MANUFACTURER'S WARRANTY

The Manufacturer warrants, to the original user, that each product of its manufacture is free from defects in material and factory workmanship if properly installed, serviced and operated under normal conditions according to the Manufacturer's instructions.

Manufacturer's obligation under this warranty is limited to correcting without charge at its factory any part or parts thereof which shall be returned to its factory or one of its Authorized Service Stations, transportation charges prepaid, within one year after being put into service by the original user, and which upon examination shall disclose to the Manufacturer's satisfaction to have been originally defective. Correction of such defects by repair to, or supplying of replacements for defective parts, shall constitute fulfillment of all obligations to original user.

This warranty shall not apply to any of the Manufacturer's products which must be replaced because of normal wear, which have been subject to misuse, negligence or accident or which shall have been repaired or altered outside of the Manufacturer's factory unless authorized by the Manufacturer.

Manufacturer shall not be liable for loss, damage or expense directly or indirectly from the use of its product or from any other cause.

The above warranty supersedes and is in lieu of all other warranties, expressed or implied, and of all other liabilities or obligations on part of Manufacturer. No person, agent or dealer is authorized to give any warranties on behalf of the Manufacturer nor to assume for the Manufacturer any other liability in connection with any of its products unless made in writing and signed by an officer of the Manufacturer.

# SPECIFICATIONS

|  |           |
|--|-----------|
| Nominal dimensions of plant (inches):                                  |           |
| Height .....   | 26 3/4    |
| Width .....  | 19 1/16   |
| Length .....   | 34 1/8    |
| Weight (approx. lb.) .....   | 500       |
| Number cylinder (vertical in-line) .....                               | 2         |
| Displacement (cubic inch) .....  | 70        |
| Cylinder bore .....  | 3 1/2     |
| Piston Stroke .....  | 3 5/8     |
| BHP at 1800 rpm .....  | 16.5      |
| RPM (for 60 cycle) .....   | 1800      |
| RPM (for 50 cycle) .....   | 1500      |
| Compression ratio .....  | 19:1      |
| ** Battery voltage (AC plant, except dual purpose) .....               | 12        |
| Battery size (AC plant except dual purpose)                            |           |
| SAE group 1H-two in series .....                                       | Yes       |
| Amp-hr, SAE 20-hr (nominal) .....                                      | 105       |
| Battery charge rate amperes (normal)-AC plants .....                   | 2 to 5    |
| * Oil capacity in U.S. quarts-Refill .....                             | 3         |
| Cooling water flow (gallons per minute) .....                          | 4         |
| Generator cooling air (CFM at 1800 rpm) .....                          | 135       |
| Combustion air (CFM at 1800 rpm) .....                                 | 31        |
| Total cu. ft. per min. of air required .....                           | 166       |
| Diesel fuel lift (maximum feet) .....                                  | 6         |
| Maximum recommended power take-off from front pulley at any load ..... | 2 hp      |
| Power take-off limit at rated load .....                               | 1 hp      |
| Injection pump (Am. Bosch type) .....                                  | PSU       |
| Output is rated at unity power factor load .....                       | 1 - phase |
| Output is rated at 0.8 power factor .....                              | 3 - phase |
| Rating (output in watts)   |           |
| AC, 50-cycle plant .....   | 6000      |
| AC, 60-cycle plant .....   | 7500      |
| AC voltage regulation in $\pm$ % .....                                 | 3         |
| AC frequency regulation in % .....                                     | 5         |
| Revolving field type generator .....                                   | Yes       |
| 120/240-volt single phase model reconnectible .....                    | Yes       |
| Static exciter (Magneciter) .....                                      | Yes       |

\*-Plus 1/2 quart for new filter

\*\*-24 and 32-volt batteries on certain modifications

# INSTALLATION

## GENERAL

Proper installation is very important. Consider the following:

1. Adequate generator cooling air.
2. Discharge of circulated air.
3. Adequate fresh induction air.
4. Adequate engine cooling water.
5. Discharge of circulated water.
6. Discharge of exhaust gases.
7. Electrical connections.
8. Fuel connections.
9. Sturdy and flat floor.
10. Accessibility for operation and service.

Use this manual as a guide to help with the installation; refer to Typical Installation, Figures 2 and 3. For more complete instructions, request Onan Technical Bulletin T-021.

Each installation must be considered individually and executed in compliance with all regulations which may affect the installation. The advice and guidance contained in the booklet entitled *Fire Protection Standard for Motor Craft*: (NFPA No. 302) offered by the National Fire Protection Association International, Boston 10, Massachusetts, will be helpful to the installer of equipment in vessels.

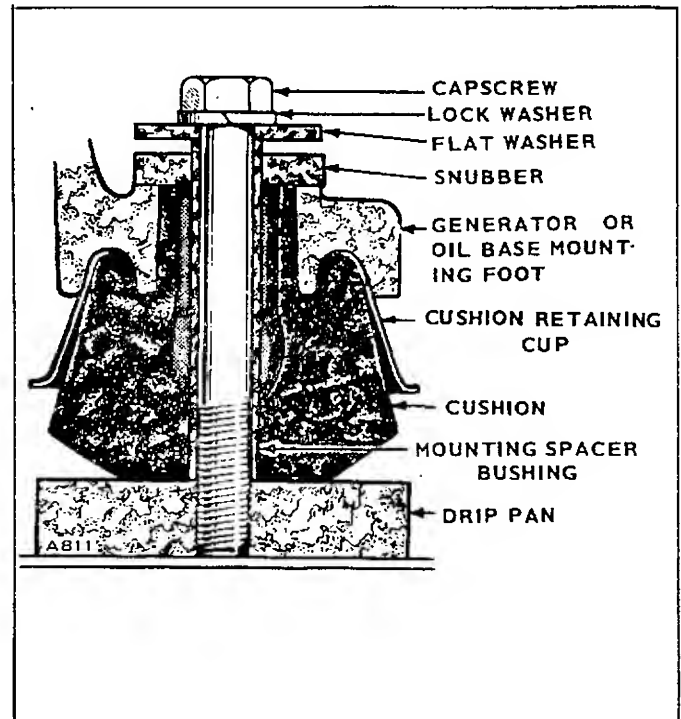


FIGURE 1. PLANT MOUNTING

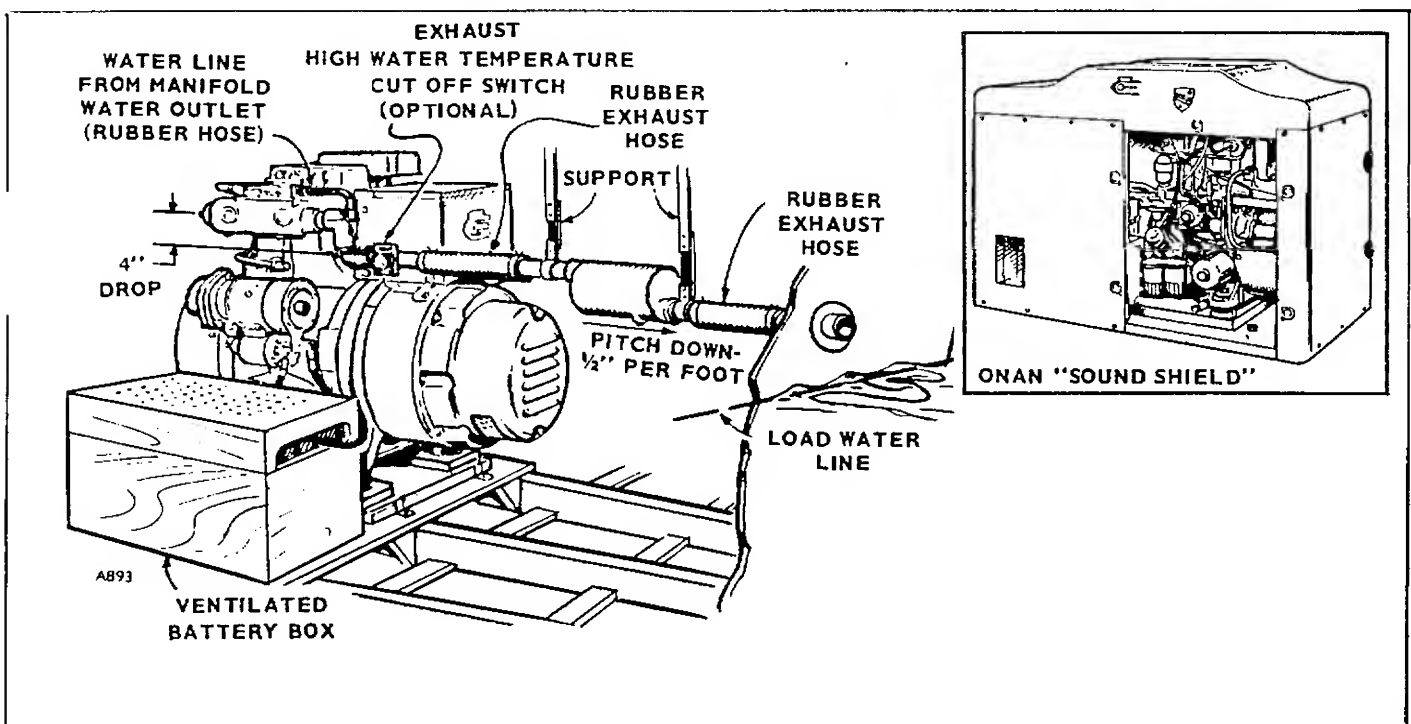


FIGURE 2. A TYPICAL INSTALLATION

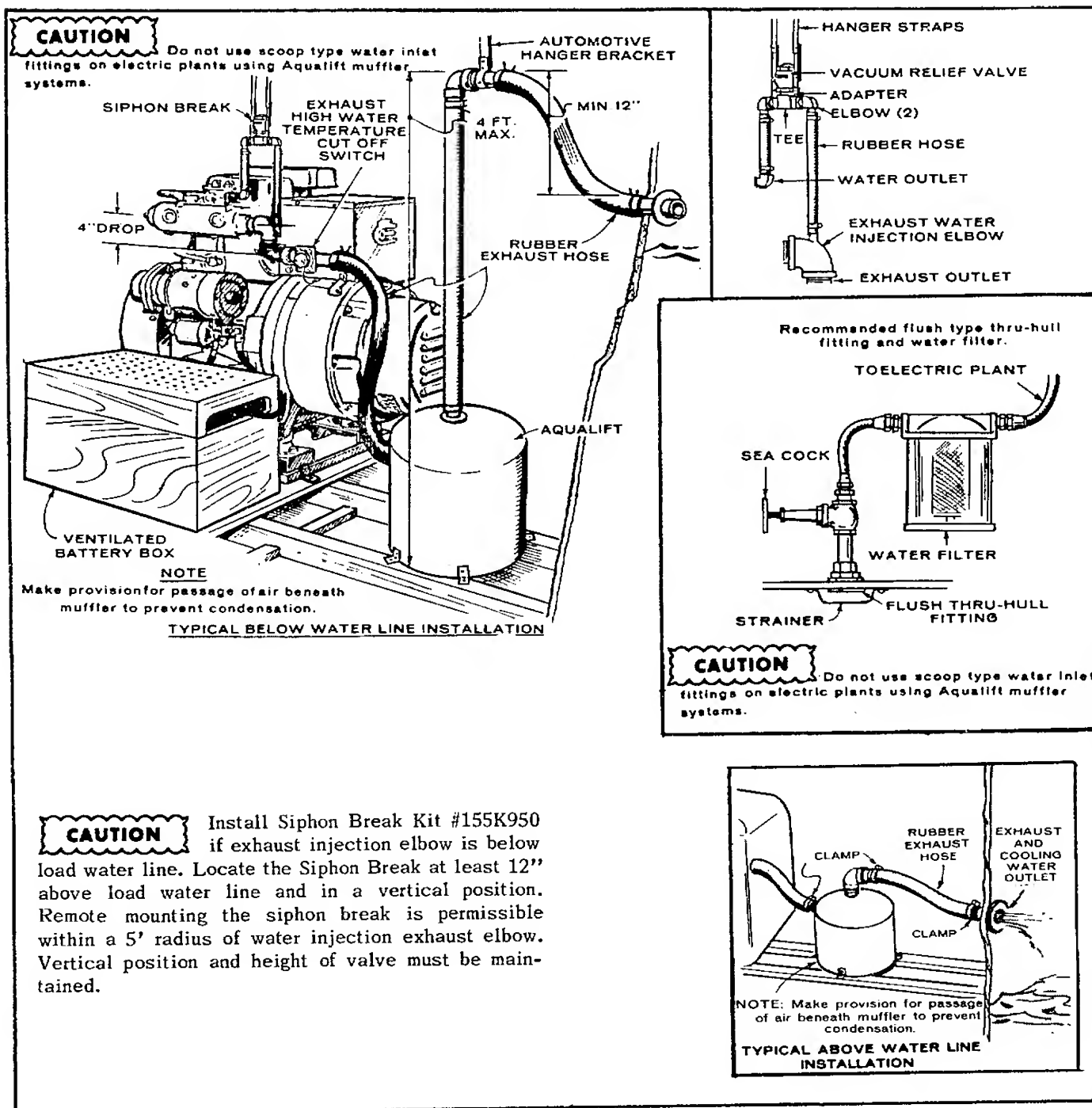


FIGURE 3. A TYPICAL INSTALLATION

## LOCATION

Select a location for the plant, preferably near the vessels main keel, which is dry, properly ventilated, above low lying vapors and splash from the bilge. Provide accessibility for minor servicing operations, draining of the crankcase lubricating oil and the cooling system.

## MOUNTING

The deck should be flat and give support directly under the plant mounting points. The unit will rock on its mounts.

A two and one half inch clearance around the unit is required to permit rocking on its mounts without restraint. Use flexible exhaust line, fuel line, battery cables and electrical wires which are adequate.

Install two hold-down clamps to the drip pan (front and rear or both sides). Secure the clamps to the mounting base.

## ONAN SOUND SHIELD

For maximum noise reduction on Onan MDJE plants, install the ONAN "Sound Shield" which is an insulated fiberglass enclosure which completely surrounds the generating plant (Fig. 2). Openings are provided for connection to all external lines and wires. Internal air ducts reduce air borne noise to a minimum. Contact your local ONAN dealer for noise reduction methods and the special kits which are available.

## AQUALIFT MUFFLER

The Aqualift is a highly efficient marine muffler designed for above or below water line installations when water cooled exhaust systems are used. Because of installation variables, customers must provide the brackets, hoses and clamps required for installation.

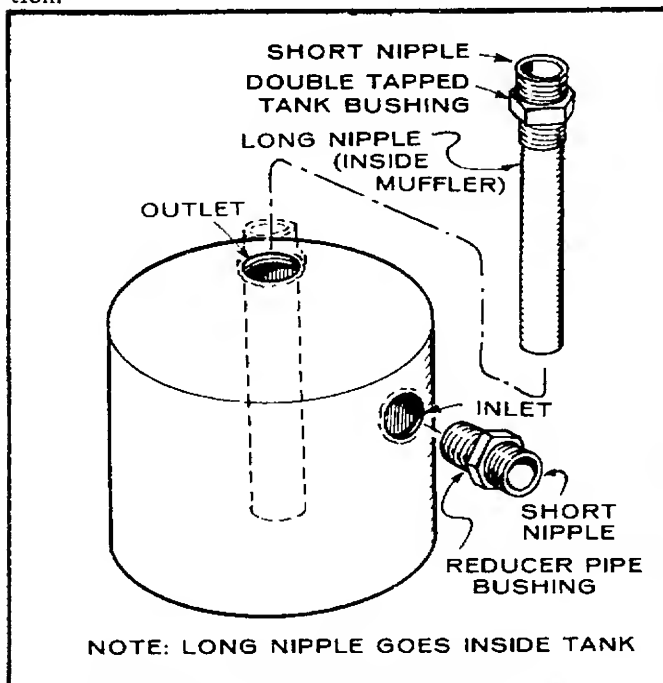


FIGURE 4. AQUALIFT MUFFLER

### CAUTION

DO NOT USE SCOOP TYPE WATER INLET FITTINGS when installing an Aqualift muffler. Forward facing scoops develop sufficient ram pressure to force water past the plant's water pump, flooding the exhaust system where it may flow back, flooding the engine cylinders. This can happen only if the electric plant is not running and boat is underway.

1. Secure the muffler to the predetermined location (within ten feet of the engine exhaust outlet) using "L" brackets (Fig. 5) or other suitable mounting devices such as wood blocks or metal straps. Flexible mounts may be used if so desired.

### CAUTION

Do not drill holes higher than one inch above the extreme lower edge of the muffler when installing mounts. Holes drilled above will damage muffler.

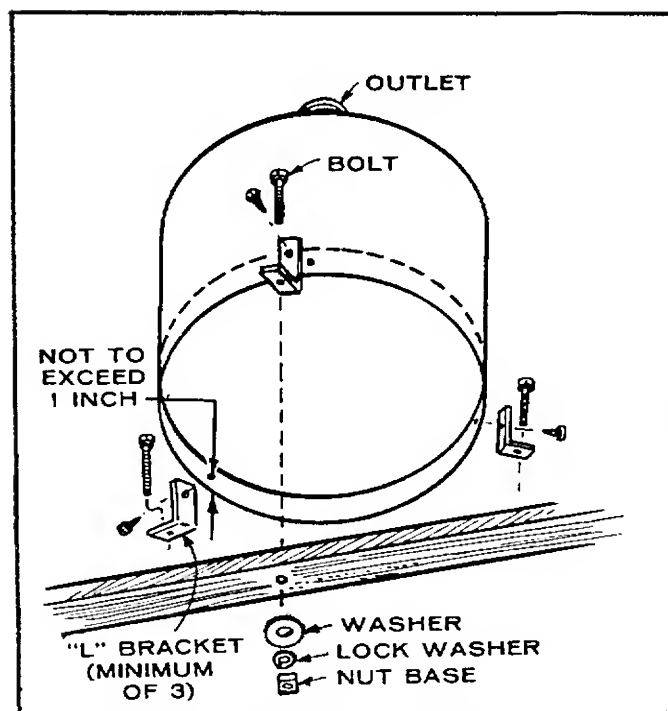


FIGURE 5. SECURING THE MUFFLER

2. Connect the exhaust line (1-1/4") to the marine elbow on the engine and to the exhaust inlet on the muffler. The distance from the base of the muffler to the upper elbow on the exhaust tubing from the muffler outlet must not exceed four feet (see Fig. 3).
3. Connect the exhaust line to the muffler outlet and to the upper elbow. A conventional automobile tail-pipe hanger bracket may be used to hang the upper elbow. Rigid pipe may be used in place of flexible hose for certain applications. There must be a pitch of one half inch per foot (i.e., a 2-1/2" drop for a five foot run) in the exhaust tubing between the engine exhaust elbow and the muffler inlet. Muffler may be mounted below the level of the engine if necessary. A minimum drop of one foot is necessary between the engine exhaust outlet on the hull to prevent water from washing into the system (see Fig. 3). An increase of one standard pipe size for every ten running feet of exhaust from the muffler to the exhaust outlet is necessary to prevent excessive back-pressure.
4. Connect the exhaust line from the upper elbow to the exhaust outlet on the hull. The exhaust outlet on the hull must be positioned so that a minimum of water will enter while at anchor or under way.

**Important:** Be sure all fittings are tight.

### CAUTION

Welding on the muffler will damage the interior protective coating decreasing the life expectancy.



## FUEL TANK

If a separate fuel tank is used, install the tank so the bottom is less than six feet below the fuel pump. The tank top must be below fuel pump level to prevent siphoning. Install a shut-off valve at the tank. When the fuel tank is shared with another engine, use a separate fuel line for each to avoid starving the plant.

If fuel lift *must* exceed six feet, install an auxiliary electric fuel pump at the fuel supply.

## FUEL CONNECTION

Connect the fuel line to the fuel pump inlet. Pump is threaded 7/16-24 NPTF (American Standard Internal Tapered Pipe Thread). Always use flexible tubing between engine and the fuel supply.

The diesel engine requires a fuel supply line and a separate fuel return line. Install the fuel return line from the 7/16-24 size opening in the overflow fitting located on the injection pump (where the nozzle fuel return line is also connected) to the top of the fuel supply tank. (Fig. 6 and 7).

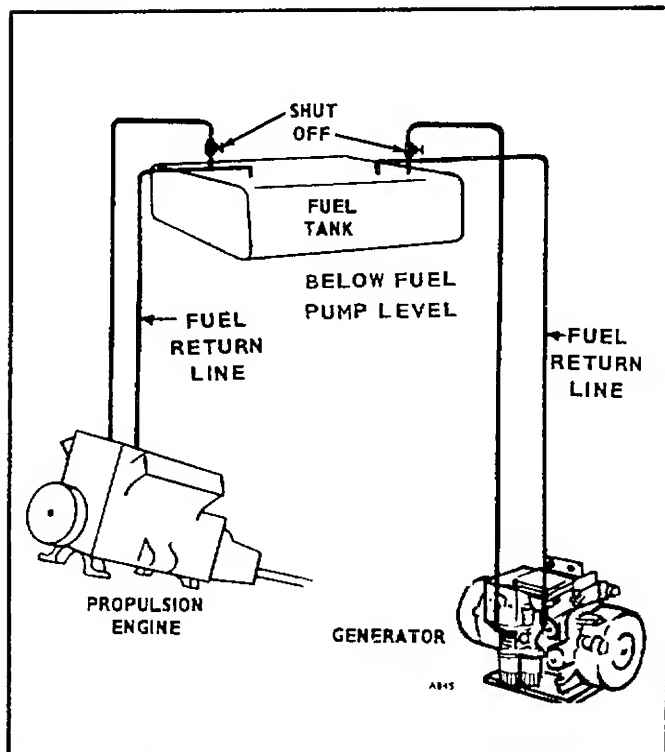


FIGURE 6. FUEL LINE ARRANGEMENT

Do not use galvanized lines, fittings, or fuel tanks in the fuel system. Carefully clean all fuel system components before putting the plant into operation. Any dirt or contamination may cause major damage to the fuel injection system.

## OIL DRAIN

The oil drain may be extended to suit the installation. The oil base has a 1/2" pipe tapped hole.

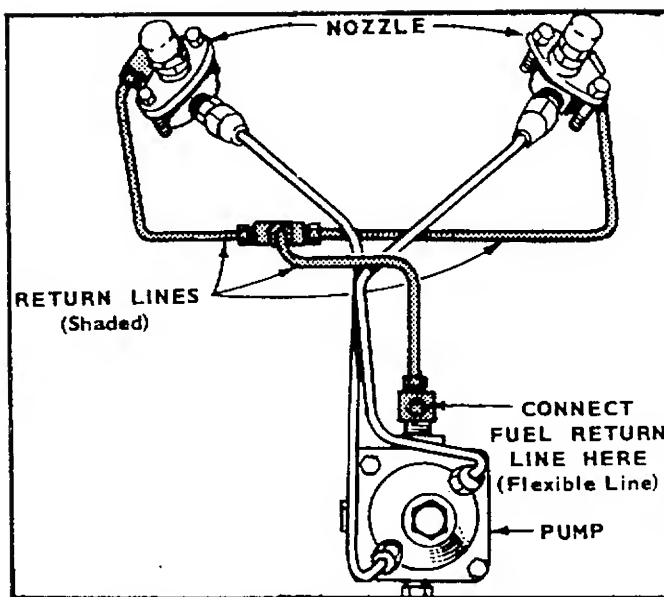


FIGURE 7. FUEL RETURN LINE

## VENTILATION

The generating plant requires fresh air for combustion and generator cooling. Onan recommends that the ventilation system be able to deliver 1-1/2 to 2 times the air required by the plant. When the ventilation system depends on wind or boat motion, use powered exhausters to provide ventilation when the boat is not in motion. For more information, refer to Onan Technical Bulletin T-021.

## EXHAUST

See Installation, Fig. 2 and 3. The engine exhaust connection is 1-1/4" pipe tapped. Pipe exhaust gases outside of the hull.

### WARNING

EXHAUST GASES ARE POISONOUS!

Install a separate exhaust line as follows:

1. Above vessel load water line
2. Pitched downward to prevent water backflow
3. Shield line near combustible material
4. Use flexible hose or tubing
5. For turns use sweeping (long radius) elbows
6. Increase one pipe size for every 10 ft. in length

Provide a tee for water line connection for wet exhaust (Fig. 2 and 11). Refer to Water Discharge Line Instructions. Raise the dry portion of the exhaust line high enough to prevent water back-flowing into the engine. The pipe tapped end of the water jacketed exhaust manifold can be changed to the opposite end for convenience in exhaust line connection.

Onan recommends using the Aqualift muffler for maximum silencing efficiency and ease of installation. Provide a recommended or equal silencer and install it near the end of the wet exhaust line.

### CAUTION

Dry exhaust will damage interior coating of an Aqualift muffler.

## WATER SUPPLY LINE

A continuous supply of cooling water is required. The water pump inlet is 1/4" pipe thread. Use a section of hose (that will not collapse) near the plant (or entire run) to absorb vibrations. The inside diameter of the plumbing must be 1/2" or larger. Use permatex or other pipe sealer on all pipe fittings in supply line to pump. Normally, the pump should deliver four gallons of cooling water per minute. Measure the discharged water flow after thermostat opens, to assure the supply line is large enough. Reduce resistance on pipe runs longer than five feet by using larger inside diameter plumbing. To prove suction line is air tight, see that no bubbles appear in discharged water. An *air leak* reduces lubrication and *shortens life of pumps impeller*. Install a strainer in the water section line inlet and where accessible for cleaning.

## BATTERY CONNECTION (Figure 8)

Battery requires negative ground. Do not attempt to change battery polarity on these plants. Refer to plant wiring diagram.

### CAUTION

If the battery is connected to the charging circuit with the wrong polarity, damage will occur after 3 minutes while stopped or in 5 seconds while running. Alternator windings will be damaged almost instantly if battery charging circuit is shorted before the resistor.

Refer to plant nameplate for battery voltage. For AC plants with 12 volt system, provide two 6 volt batteries connected in series (one battery's negative to other battery's positive) for 105 amp hr, 12 volt source. For AC plants with 32 volt system provide 32 volt set of batteries and 200 ampere fused switch, see wiring diagram for connections.

Connect the battery positive (+) to the starter engaging solenoid terminal post. Connect the battery negative (-) to a good ground on the engine.

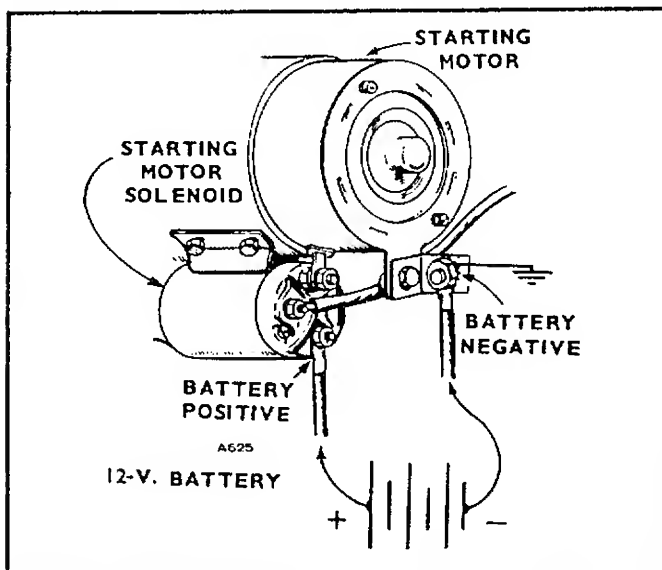


FIGURE 8. BATTERY CONNECTION

## REMOTE START-STOP SWITCH (OPTIONAL)

For remote control starting and stopping, use 3 wires to connect the remote switch (SPDT, momentary contact, center off type) to the terminal block marked B+, 1, 2, 3, in the plant control box using wire sizes as listed in Fig. 9. Preheat circuit requires an extra wire to terminal H and momentary contact switch (SPST) connection. Remove jumper between terminals 3 and H before installing remote wiring.

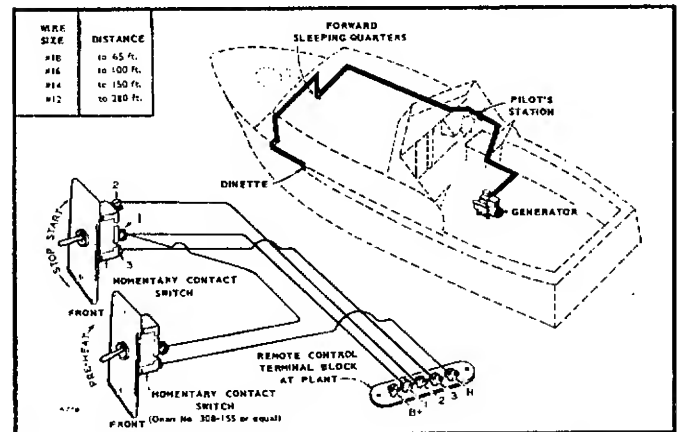


FIGURE 9. REMOTE STARTING

## LOAD WIRE CONNECTIONS (AC)

Plant nameplate shows the electrical output rating of the plant in watts, volts and cycles. The plant wiring diagram shows the electrical circuits and connections necessary for the available output voltage. See Fig. 10.

The plant control box (junction box) has knock out sections to accommodate load wires. Use flexible conduit and stranded load wires near the plant to absorb vibration. Use sufficiently large insulated wires. Strip insulation from wire ends as necessary for clean connections. Connect each load wire to the proper generator output lead inside the plant control box. Insulate bare ends of ungrounded wires. Use a bolt (through the control box) to connect the grounded ( $\oplus$ ) generator lead and load wire. Install a fused main switch (or circuit breaker) between the generating plant and load. If a test-run indicates wrong rotation of 3 phase motors in the load circuit, switch the connections at any two generator terminals.

Meet all applicable electric code requirements. Work should be done by a qualified serviceman or electrician because the installation will be inspected and approved.

**Balance All Loads:** Current for any one output load must not exceed nameplate rating. Overloading can damage the generator windings. Divide the loads equally between output leads.

**Single Phase Loads on Three Phase Generators:** Any combination of single phase and three phase loading can be used at the same time as long as the current for any one output lead does not exceed the generator nameplate rating.

**Output Lead Markings:** Revolving field generators are marked T1, T2, etc. These identifying marks also appear on the wiring diagram.

**Voltage Selection on Reconnectable Single Phase Generators:** These models are reconnectable for use as 120/240 volt, 3 wire, 120 volt 2 wire, or 240 volt 2 wire power source (Fig. 10).

**Delta Generator (Revolving Field Models Only):** Generator lead T0 is the generator center tap between T1 and T2. The T0 lead is normally not grounded but can be grounded if required.

**Load Connections:** Refer to the figure which illustrates the load connection for the output shown on your plant's nameplate.

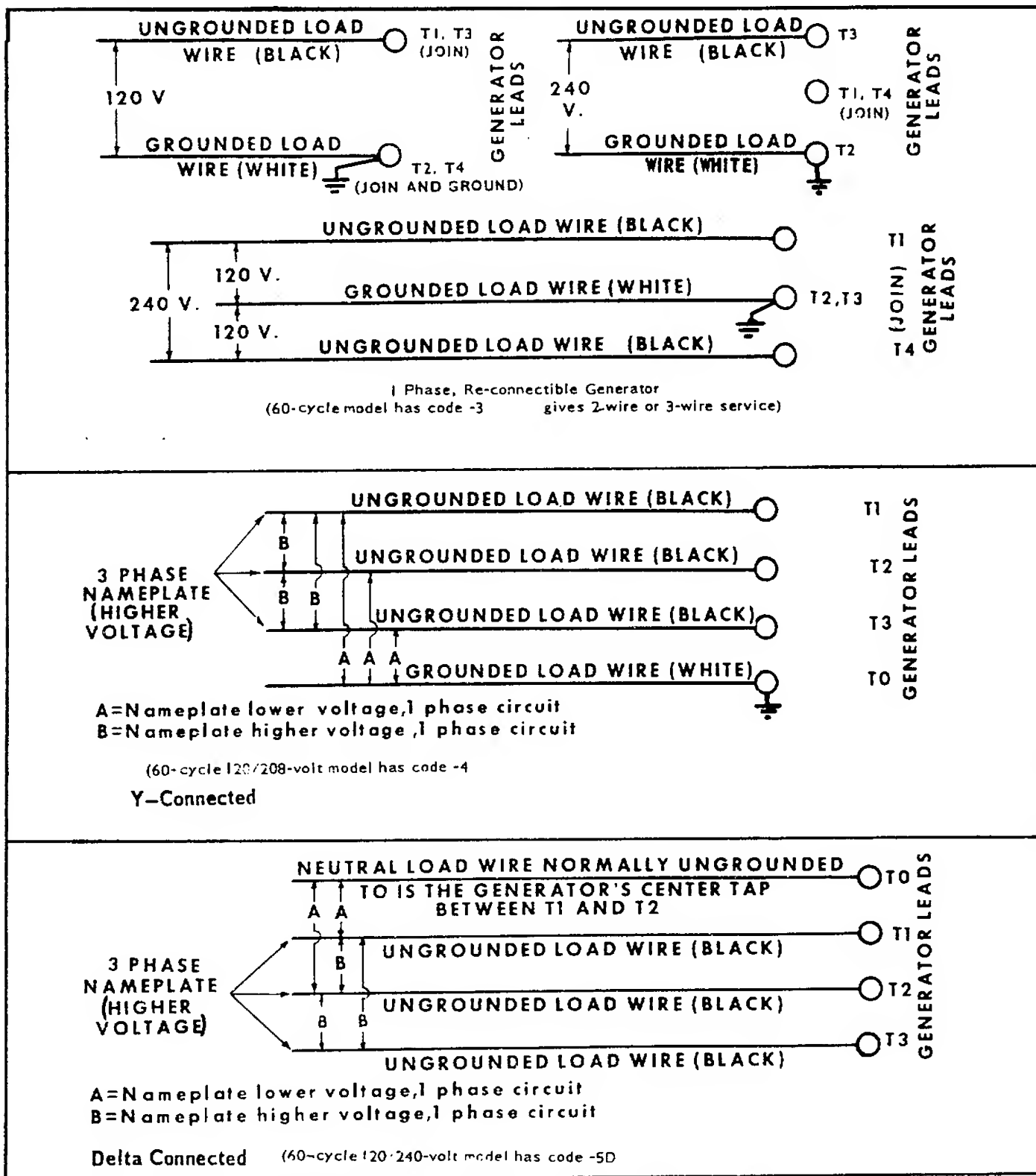


FIGURE 10. WIRING CONNECTIONS

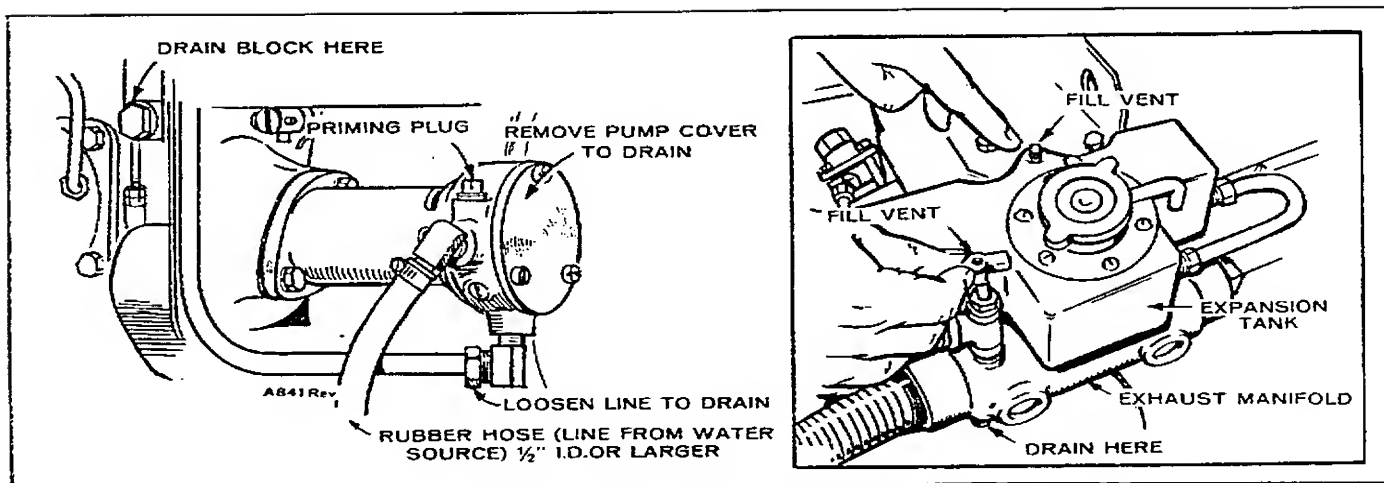


FIGURE 11. FILL AND DRAIN LOCATIONS

### HEAT EXCHANGER COOLING (Optional).

This is a closed cooling system commonly referred to as fresh water cooling. Water circulated through the engine is termed fresh water, hot water, jacketed water, etc. Water circulated through the heat exchanger only is called raw water, sea water, cold water, discharged water, etc. This system (or anti-freeze coolant) is recommended where freezing hazards exist or when the owner wants to prevent salt water problems.

Two conditions prevail: (1) Factory installed heat exchanger, and (2) Customer installed Onan heat exchanger kit. Get details from Onan Distributor.

**CAUTION** Do not use existing neoprene impeller water pump for hot water side of cooling system. Heat or soluble oil (in many rust inhibitors and anti-freezes) will damage the impeller. Always connect the neoprene impeller pump to the cold water side. Use a centrifugal metal impeller water pump (Oberdorfer 1-GP, or equal) in the hot water side. Drive it with a belt from the plant's power take-off.

Use an expansion tank in the hot water side.

**CAUTION** Before filling cooling system remove square head fill vent and open vent valve (turn counterclockwise) on expansion tank. When filled, replace square head plug and close vent valve (clockwise rotation.) If this procedure is not followed heating problems will develop. See Figure 11.

Fill closed cooling systems with clean, alkali-free water, to the proper level in the expansion tank. Add an approved rust inhibitor to the coolant. If the coolant is anti-freeze, test it periodically. Cooling system capacity is 4-1/2 quarts.

When engine warms up, recheck expansion tank to assure cooling system is full.

Install a new zinc "pencil" (Figure 12), which screws into the raw water inlet end of the heat exchanger, every two months or as inspection dictates.

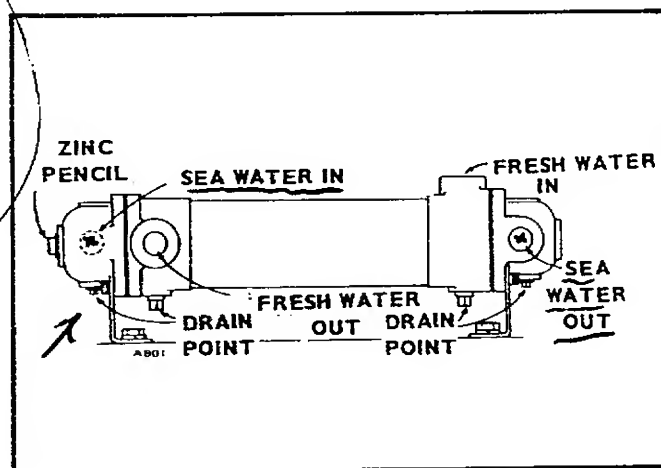


FIGURE 12. HEAT EXCHANGER

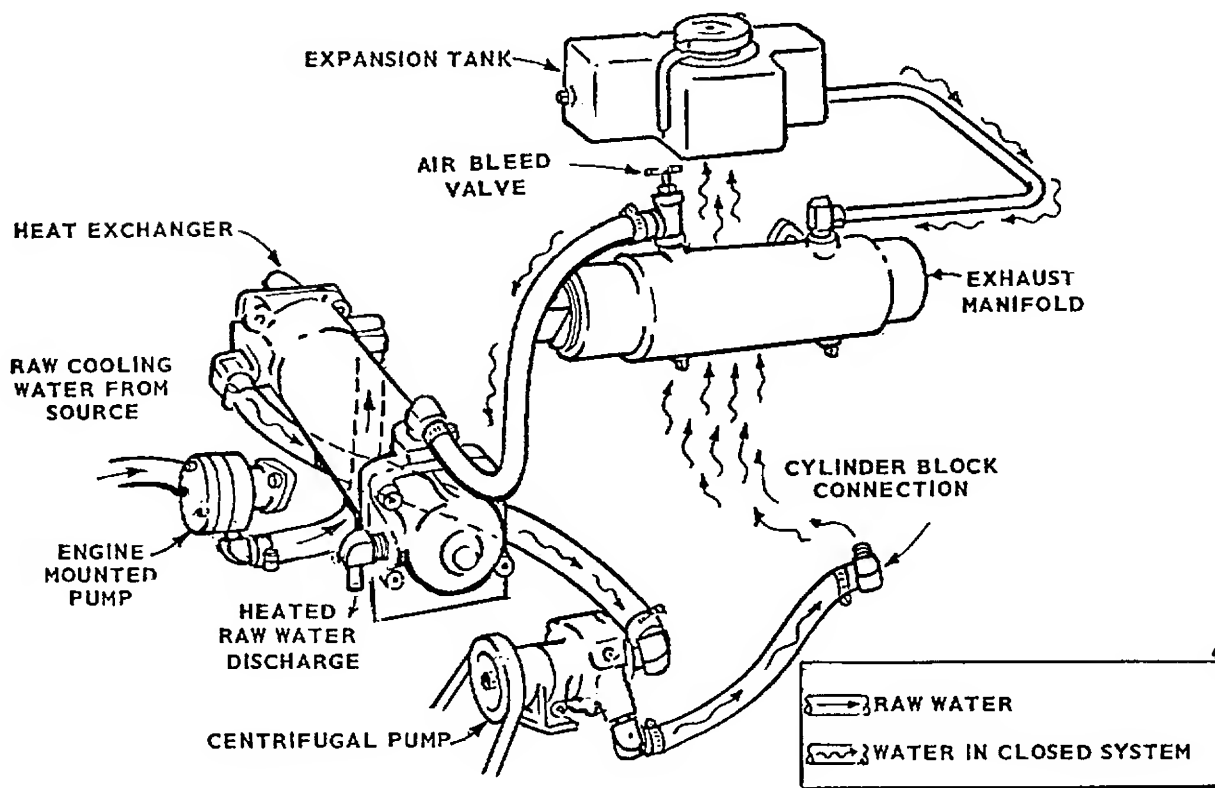


FIG. 13-A

# OPERATION

## CRANKCASE OIL

Use an oil with the API designation DS that has passed the Series 3 Test and the Sequences IIA and IIIA of the Automotive Manufacturer's MS Sequence Tests. (DM oil which has passed the Automotive Manufacturer's MS Sequence Tests and the MIL-L-2104B may also be used when ambient temperatures are lower than 30°F). To reduce oil consumption to a normal level in the shortest time on a new or rebuilt "J" series diesel engine, use DM oil (passing the MS Sequence Tests) for the first fill only (50 to 100 hours), then change to the recommended oil.

| TEMPERATURE | GRADE               |
|-------------|---------------------|
| Above 30°F  | SAE 30              |
| 0°F to 30°F | SAE 10W<br>or 5W-20 |
| Below 0°F   | SAE 5W-20           |

Do not mix brands or grades. Refer to Maintenance Section for recommended oil changes.

## RECOMMENDED FUEL

Depends on operating conditions. Use No. 2 diesel fuel for best economy. Use No. 1 diesel fuel (a) when ambient temperature is below 32°F., or (b) at all temperatures during long periods of light engine load, (c) if preferred by user. Use low sulfur content fuel having a pour point (ability to filter) of at least 10°F. below the lowest expected temperature. Keep fuel clean and protected from adverse weather. Leave some room for expansion when filling the tank.

## INITIAL START

Check the engine to make sure it has been filled with oil and that fuel system is air-free.

Bleed air from fuel system as follows: Disconnect the fuel return line. See Fig. 13. Operate the hand priming lever on diaphragm type fuel transfer pump until there are no air bubbles in fuel flowing from the fuel return line fitting. Then connect the fuel return line.

**NOTE:** If the camshaft's pump lobe is up, crank engine one revolution to permit hand priming. When finished, return priming lever inward (disengaged position) to permit normal pump operation.

Temporarily remove the plug from the water pump inlet fitting. Figure 11. Fill the pump with water to lubricate and prime it.

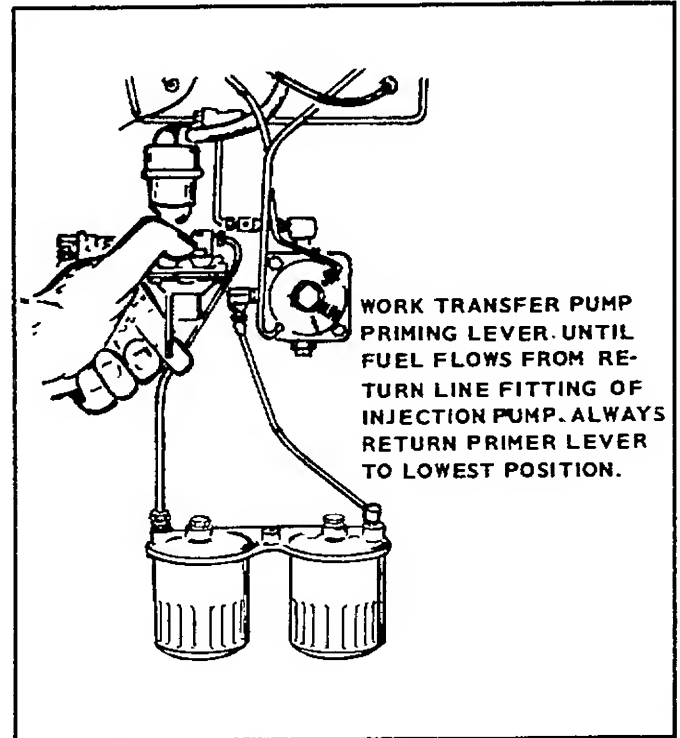


FIGURE 13. BLEEDING THE FUEL SYSTEM

## STARTING

(1) For cold engine starting above 55°F, depress the manifold heater switch for one minute. (2) Push START-STOP switch to its START position. (3) Release switch after engine starts and reaches speed. (4) Oil pressure should read at least 20 psi (pressure-relief valve is not adjustable).

If the plant control has a re-set button, push it to re-set *after* a shutdown resulting from low oil pressure or *high* water temperature occurs. Find the cause before re-starting the engine.

The adjustable resistor slide tap (in the charging circuit) is set to give approximately 2 ampere charging rate. For applications requiring frequent starts, check battery specific gravity periodically and, if necessary, increase the charging rate slightly (move slide tap nearer ungrounded lead) until it keeps the battery charged. Adjust only after plant stops. Avoid overcharging. The resistor is located in the generator air outlet.

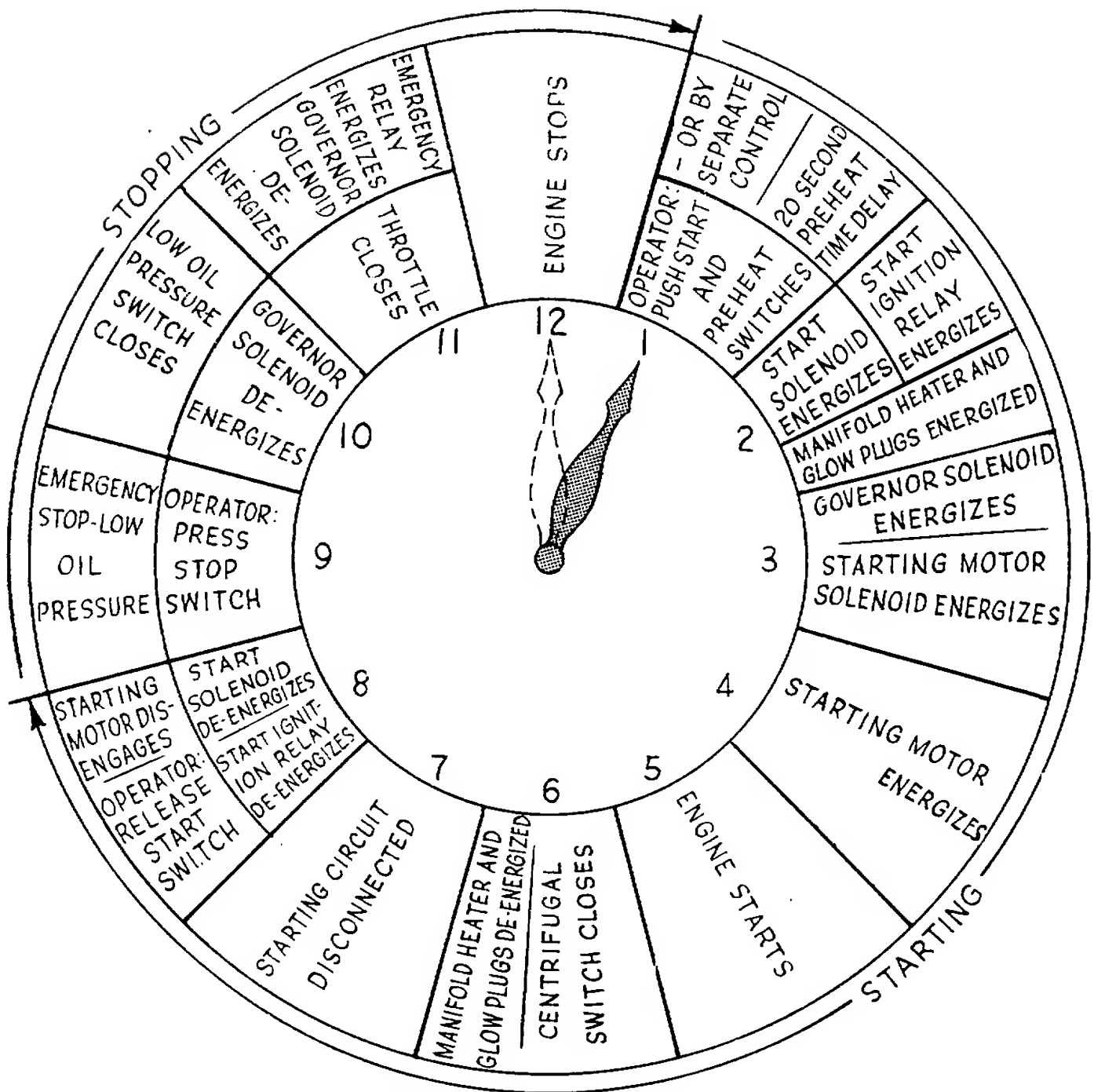


FIGURE 14. OPERATING CYCLE

If using a separate automatic demand control for starting and stopping, adjust the charge rate for its maximum 4.5 amperes. This normally keeps battery charged even if starts occur as often as 15 minutes apart.

If a false start occurs, make sure the centrifugal switch (Fig. 15) closes during speed build-up.

Extremes in starting temperatures can require additional preheating. If engine fails to start quickly, rest engine several seconds and repeat starting sequence applying preheat for a longer interval.

#### AUTOMATIC STARTING AND STOPPING

Separate controls may be used for automatic start and stop, but must provide engine pre-heating.

The automatic control has a time delay relay to pre-heat glow plugs and the manifold heater for 20 seconds before cranking occurs. Remove the jumper in the plant's control box which connects terminal H (heater) to terminal 3 (start circuit) and connect separate-control pre-heat circuit to the plant H terminal when installing the control. The time delay relay also delays engagement of the starter when load is reapplied before the engine stops completely.

## STOPPING

- (1) Push *start-stop* switch to *stop* position.
- (2) Release switch when plant stops. If stop circuit fails, close fuel valve.

## APPLYING LOAD

If practicable, allow plant to warm up before connecting a heavy load. Continuous generator overloading may cause high operating temperatures that can damage the windings. The generator can safely handle an overload temporarily, but for normal operation, keep the load within nameplate rating. The exhaust system may form carbon deposits during operation at light loads; apply full load occasionally before shutdown to prevent excessive carbon accumulations.

Try to connect the load in steps instead of full load at one time. Most installations use a line switch that must be closed to connect a portion of the load.

## EXERCISE STANDBY PLANTS

Infrequent use results in hard starting. Operate standby plants at least 30 minutes each week. Run longer if battery needs charging.

## BREAK-IN PROCEDURE

Follow the procedure below for proper plant break-in. Use DM oil. (See oil requirements for correct viscosity.)

1. One-half hour at half load.
2. One-half hour at three-quarter load.
3. Full load.

The DM oil speeds the piston ring seating process and should remain in the engine during the first 50 to 100 hours. Then use Series 3 oil.

Continuous running under half load during the first few hundred hours may result in poor piston ring seating, causing higher than normal oil consumption and blow-by.

## SAFETY DEVICES

In case of dangerously high coolant (water) temperature or low oil pressure, the cut-off switch stops the plant. After an emergency stop, investigate and correct the cause. Press reset button before re-starting.

## EMERGENCY OPERATION IF BATTERY FAILS

MDJE generating plants require a battery for running. If the plant battery fails completely and plant must be operated during an emergency, a battery can be shared with other equipment provided the plant charging circuit is disconnected as follows: Remove the ammeter wire connected to terminal #8 in the control box and tape the bare end. The plant will not charge the battery with this lead wire disconnected.

## OUT-OF-SERVICE PROTECTION

When taking plant out of service for 30 days or longer, proper storage methods must be used to prevent damage from corrosion, contamination, and temperature extremes.

### Fuel & Air System

1. Clean flame arrester or air cleaner thoroughly - do not service air cleaner with oil.
2. Cover or seal exposed flame arrester or air intake openings.
3. Clean throttle linkage (and governor linkage) thoroughly. Lubricate metal ball joints with light machine oil (do not lubricate plastic ball joints).

### Oil System

1. Drain engine lubricating oil while engine is warm. Service the engine with proper oil. TAG the engine to IDENTIFY the lubricating oil installed. Secure the oil filter cap.
2. Remove fuel injectors. Pour 2 ounces of rust inhibitor oil (SAE50 substitute) into each cylinder. Crank engine over by hand several revolutions to lubricate cylinder walls, pistons, and rings. Install injectors.
3. Remove and service oil filter.
4. Clean crankcase breather valve.

### Cooling System

1. Drain entire cooling system including water cooled exhaust manifold and exhaust line. Drain heat exchanger or keel cooler components, engine cylinder block, and water pumps.

Generating plants equipped with heat exchanger or keel cooling may be filled with a good quality anti-freeze if freezing temperatures are expected. Drain only those components not protected from freezing (exhaust lines, water intake and outlet lines, etc.).

### Electrical System and Batteries

1. Clean generator brushes, commutator, and slip rings by wiping with a clean, dry, lint-free cloth. DO NOT LUBRICATE THESE PARTS.
2. Clean static exciter with dry low-pressure air. Remove dust and dirt deposits in control box and junction boxes.
3. Disconnect batteries and remove from vessel. Service batteries by maintaining liquid level and using a trickle charger to maintain voltage.

### CAUTION

Discharged batteries are subject to severe damage if exposed to freezing temperatures: STORE ALL BATTERIES IN A FULLY CHARGED CONDITION AND MAINTAIN CHARGE DURING STORAGE.

### General

1. Cover or seal all exposed openings (exhaust outlet, water parts, etc.)



2. Cover entire generating plant.  
TAG and IDENTIFY plant to indicate SERVICE REQUIRED BEFORE ATTEMPTING TO OPERATE. List all items requiring attention and service prior to operation.

5. Keep governor linkage clean.
6. Clean generator brushes, slip rings, and commutator - do not remove normal (dark brown) film. Do not polish.

#### **RETURNING THE PLANT TO OPERATION**

1. CHECK SERVICE IDENTIFICATION TAGS to properly service the plant.
2. Uncover and remove storage seals from entire plant. Remove any dust, dirt, or foreign matter.
3. CHECK fuel supply tanks for moisture accumulations (drain tanks if necessary). CHECK lubricating oil for moisture or contamination (drain if necessary). CHECK fuel line connections, all wiring connections, and exhaust line connections.
4. Service air cleaner (if used) or clean flame arrester. Torque fuel injectors and bleed fuel system (if moisture or contamination are found in fuel—replace secondary filter and clean primary filter).
5. Service cooling system with clean fresh water. Prime water pump and see that all air is bled from cooling system. If anti-freeze was left in closed type cooling system, check level and service as required.
6. Check entire plant for water, fuel, or oil leaks. Correct leakage as required.
7. Install fully charged batteries.
8. Start the plant in normal method. Check the running plant for leaks, correct voltage output, proper cooling.

#### **HIGH TEMPERATURES**

1. See that nothing obstructs air flow to-and-from the plant.
2. Keep cooling system clean. Maintain water level in closed system cooling.

#### **LOW TEMPERATURES**

1. Use correct SAE No. oil for temperature conditions. Change oil only when engine is warm. If an unexpected temperature drop causes an emergency, move the plant to a warm location or apply heated air externally until oil flows freely. (Never use an open flame.)
2. Protect fuel against moisture condensation.
3. Keep batteries in a well charged condition.
4. Partially restrict cool air flow but use care to avoid overheating.
5. Add good quality anti-freeze if danger of freezing exists.

#### **DUST AND DIRT**

1. Keep plant clean. Keep cooling system clean.
2. Service flame arrester (or air cleaner) as frequently as necessary.
3. Change crankcase oil every 50 operating hours.
4. Keep oil and fuel supplies in dust-tight containers.

# SERVICE AND MAINTENANCE

## CHECK CENTRIFUGAL BREAKER POINTS

Replace burned or faulty points. If only slightly burned, dress smooth with file or fine stone. Measure gap with thickness gauge (Fig. 15).

The centrifugal switch is wide open when engine is stopped. Loosen and move stationary contact to correct gap.

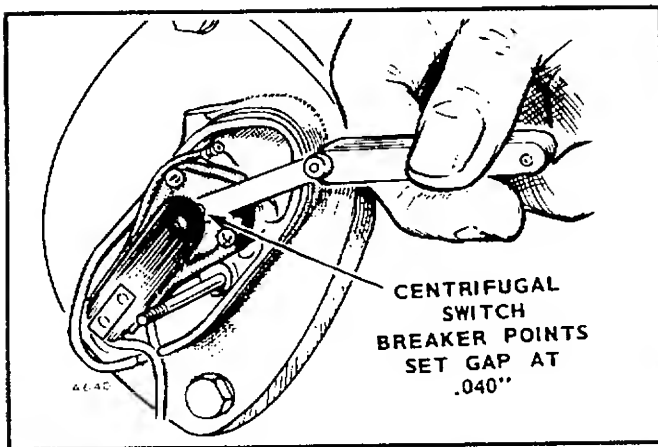


FIGURE 15. SETTING GAP

## THROTTLE STOP SCREWS

Set the maximum stop screw (Fig. 16) while gradually increasing the load to stop the throttle at smoke point.

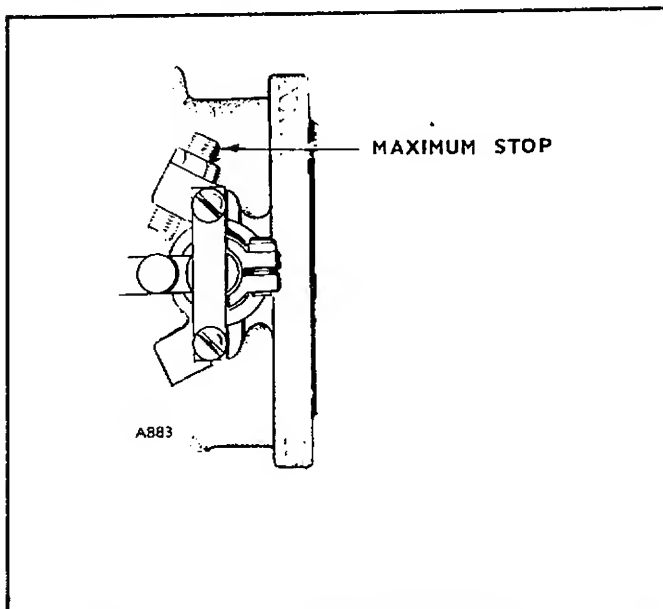


FIGURE 16. SETTING STOP SCREW

## GOVERNOR

The governor controls engine speed. Rated speed and voltage appear on the nameplate (see also Specifications). Engine speed equals frequency multiplied by 30 on a 4 pole generator, thus 1800rpm is 60 cycles. The speed should not vary more than 3 cycles from no-load to full-load operation. Be sure throttle, linkage and governor mechanism operate smoothly.

**Speed Adjustment:** To change the governor speed, change the spring tension by turning the governor spring nut (Figure 18). Turn the nut clockwise (more spring tension) to increase RPM and counterclockwise to reduce governed speed. Hold a tachometer against flywheel cap screw or use frequency meter.

**Sensitivity Adjustment:** To adjust governor sensitivity (no-load to full-load speed droop), turn the sensitivity adjusting ratchet (Figure 18). Counterclockwise gives more sensitivity (less speed drop when full load is applied), clockwise gives less sensitivity (more speed drop). If the governor is too sensitive, a rapid hunting condition occurs (alternate increasing and decreasing speed). Adjust for maximum sensitivity without hunting. After sensitivity adjustment, the speed will require readjustment. After adjusting the governor, secure lock nut.

**IMPORTANT:** Excessive droop may be caused by engine misfiring. Correct this condition before adjusting governor.

## VALVE CLEARANCE

Check valve clearance when the engine is at room temperature (about 70°F).

1. Turn the flywheel until the cylinder which is to have its valve adjusted is on its compression stroke. Use a socket wrench on the flywheel retaining screw.

To determine if the cylinder is in its compression stroke, observe the action of the push rods as the engine is rotated in a clockwise direction. The exhaust valve push rod will be in its lowest position and the intake valve push rod will be moving downward. As the piston reaches top dead center, the flywheel timing mark should be aligned with the timing pointer and the valve push rods stationary.

2. Now turn the flywheel clockwise for an additional 10 to 45 degrees. There is no timing mark for this position so it must be estimated. With the piston located in this position, it will be in its power stroke with both valves completely closed.

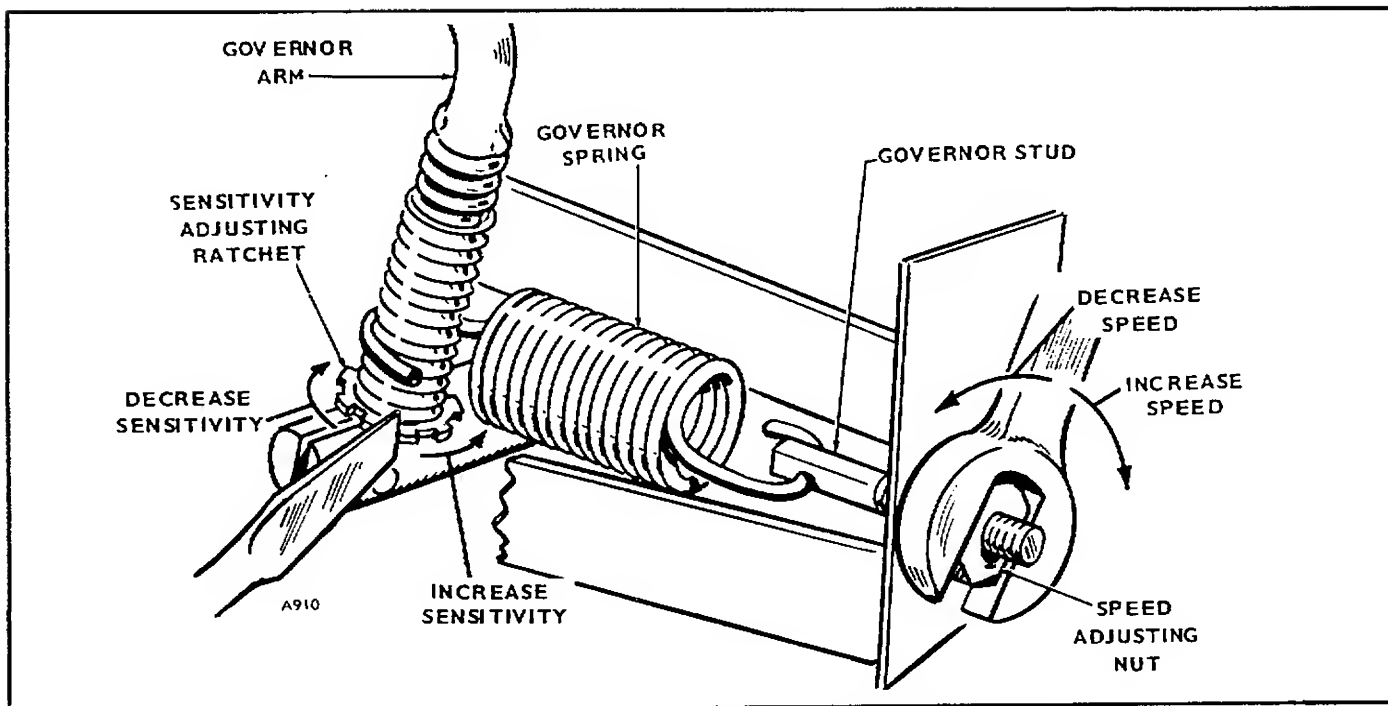


FIGURE 17. GOVERNOR ADJUSTMENT

3. To change the setting of valve clearance, adjust the locknut which secures the rocker arm to the cylinder head (see Fig. 18). Loosen the locknut to increase clearance and tighten it to reduce clearance.
4. Using a feeler gauge, check the clearance between the rocker arm and the valve (see Fig. 19). Increase or reduce the clearance until the proper gap is established. Correct valve clearance is 0.017" intake and 0.017" exhaust.
5. After allowing engine to cool, adjust #1 cylinder. After timing the #1 cylinder, adjust the valve

clearance according to steps 2 and 3.

6. To adjust the valve clearance of #2 cylinder, turn the flywheel in a clockwise direction 360 degrees (one full revolution) from the position used when timing #1 cylinder. The flywheel position should be between 10 and 45 degrees past the TC (top center) flywheel mark.
7. After timing #2 cylinder, adjust the valve clearance according to steps 3 and 4.

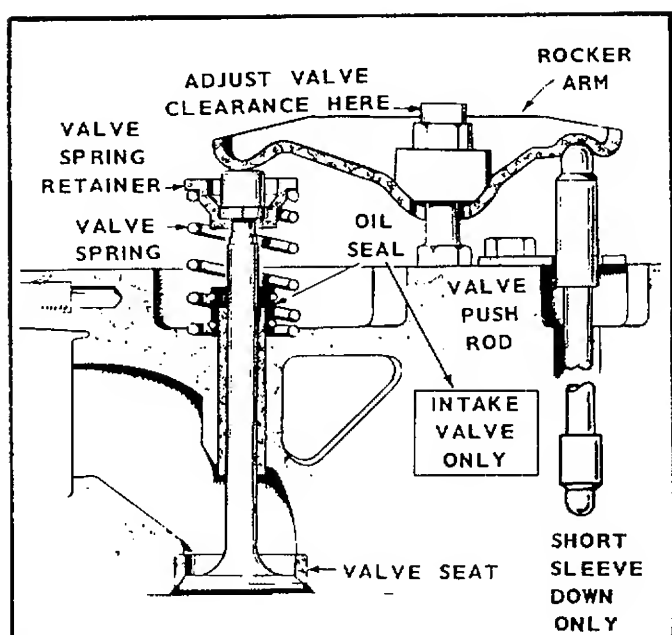


FIGURE 18. VALVE MECHANISM

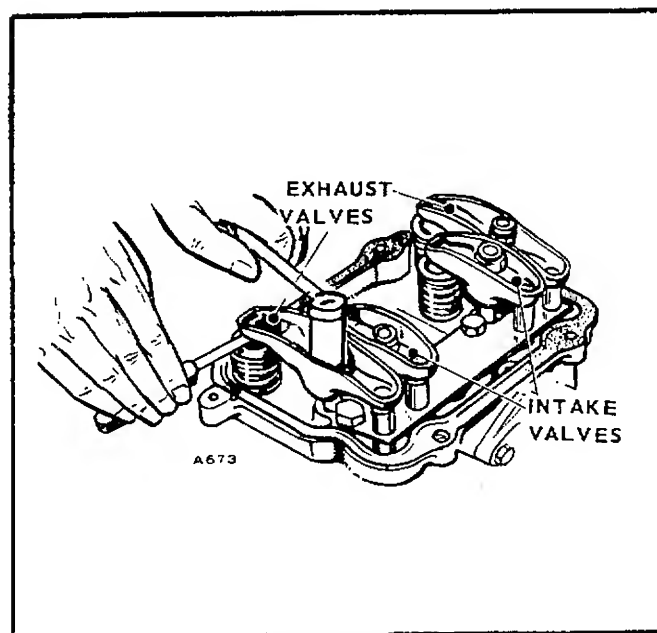
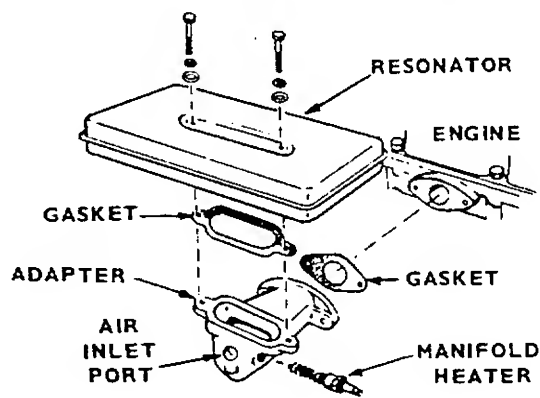


FIGURE 19. ADJUSTING VALVES

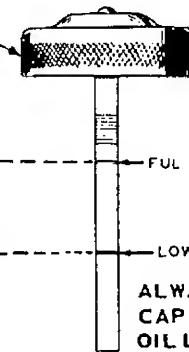


**RESONATOR**

**CAP AND OIL  
LEVEL INDICATOR**

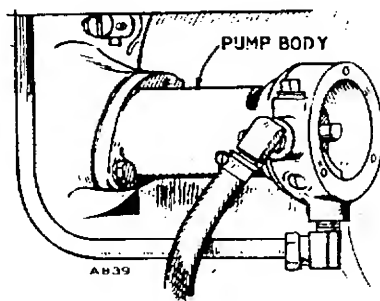
**KEEP OIL  
AT THIS LEVEL**

**NEVER OPERATE  
ENGINE WITH OIL  
BELOW THIS LEVEL**

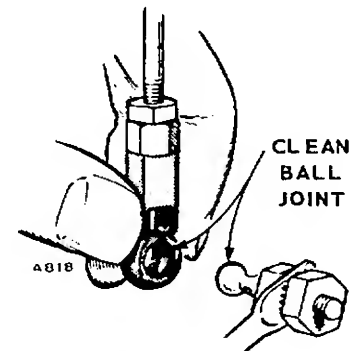
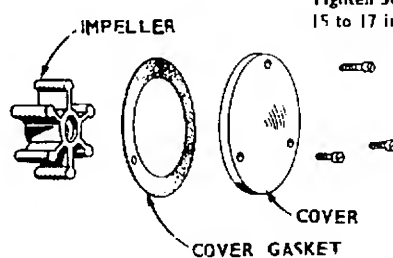


**ALWAYS REPLACE  
CAP TIGHTLY, OR  
OIL LEAKAGE MAY  
OCCUR.**

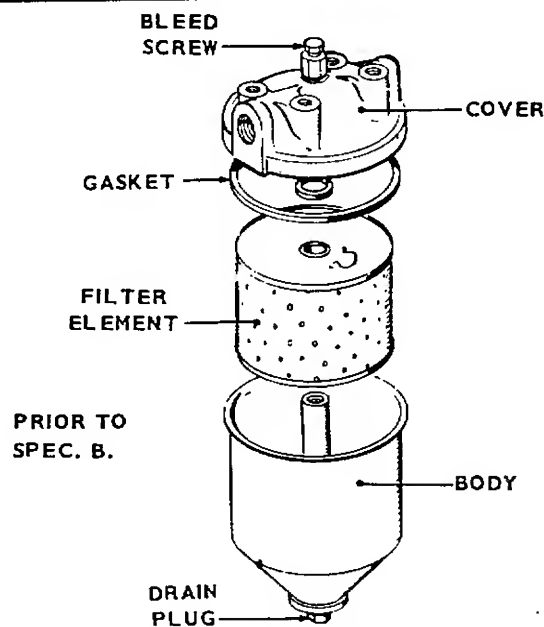
**OIL LEVEL INDICATOR**



**WATER PUMP**

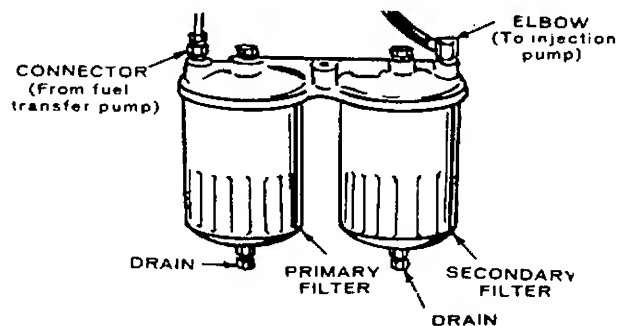


**BALL JOINT**



**SECONDARY FUEL FILTER (Spec. A Only)**

**FIGURE 20. SERVICING PROCEDURES**

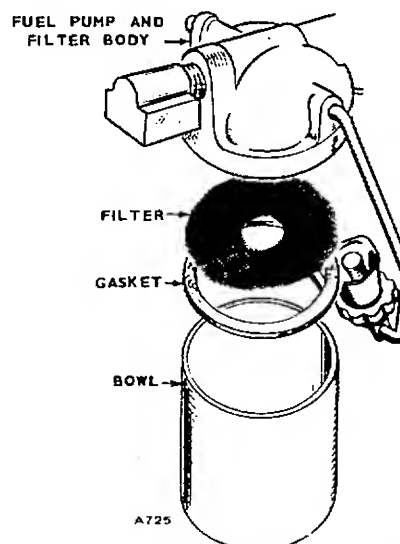


#### DUAL FUEL FILTER SYSTEM-BEGIN SPEC B

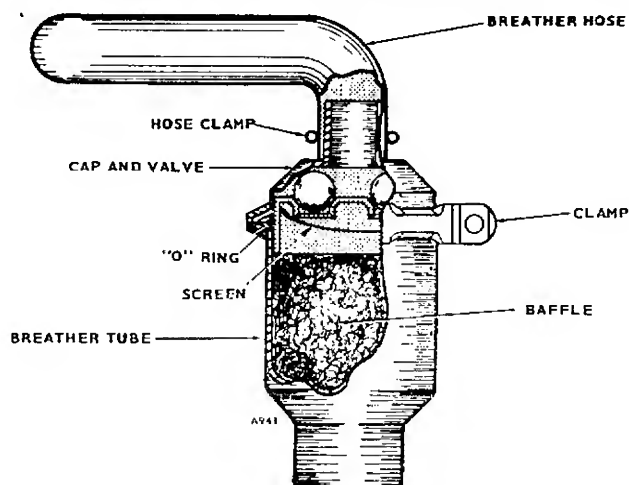
Drain water periodically as required. Replace primary filter every six hundred (600) hours. Perform more often in extremely dusty conditions. Replace secondary filter with every 5th change of the primary filter.

**CAUTION** Drain plug on fuel filters can tolerate only a limited amount of torque. Use two wrenches in combination for breaking plug loose and for final tightening.

**DUAL FUEL FILTER**



**FUEL PUMP SEDIMENT BOWL**



Remove hose clamp, breather hose, breather cap clamp and insulator halves to release breather cap and valve assembly. Wash cap and valve assembly and the baffle in suitable solvent and reinstall.

**CRANKCASE BREATHER**

#### GENERATOR SET ROUTINE CHECK CHART

Before generator set is put in operation, check all components for mechanical security. If any abnormal condition, defective part, or operating difficulty is detected, repair or service as required. The generator

set should be kept free of dust, dirt, and spilled oil or fuel. Be sure proper operating procedure is followed.

| WHAT TO CHECK      | HOW TO CHECK  | PRECAUTIONS   |
|--------------------|---|---|
| Engine oil         | Check level (should be at full mark on oil indicator)       | Add oil as necessary to bring level to full mark.                 |
| Engine Fuel        | Check level in tank.  | See that fuel line is properly connected.                         |
| Engine ventilation | Check ventilating openings.                                 | Remove any obstructions.  |
| Connecting cables  | Check for proper connections.<br>Check for physical damage. | Tighten connections.<br>Replace damage connectors.                |
| Battery            | Check electrolyte level.                                    | Keep level above plates.<br>Add only approved water as necessary. |

## MAINTENANCE SCHEDULE

Use this factory recommended maintenance (based on favorable operating conditions) to serve as a guide to get long and efficient plant life. Neglecting routine maintenance can result in failure or permanent damage to the plant.

Maintenance is divided into two categories: (1) OPERATOR MAINTENANCE - performed by the operator, and (2) CRITICAL MAINTENANCE - performed by qualified service personnel.

### OPERATOR MAINTENANCE SCHEDULE

| MAINTENANCE ITEMS                            | OPERATIONAL HOURS |     |     |      |      |
|--|-------------------|-----|-----|------|------|
|  | 8                 | 100 | 200 | 1000 | 3000 |
| Inspect Plant For Leaks, etc.                | x                 |     |     |      |      |
| Check Water Level<br>(Heat Exchanger Models) | x                 |     |     |      |      |
| Inspect Exhaust System                       | x6                |     |     |      |      |
| Check Fuel                                   | x2                |     |     |      |      |
| Check Oil Level                              | x                 |     |     |      |      |
| Clean Governor Linkage                       |                   | x1  |     |      |      |
| Change Crankcase Oil                         |                   | x1  |     |      |      |
| Drain Fuel System Condensation Traps         |                   | x2  |     |      |      |
| Clean Crankcase Breather                     |                   |     | x   |      |      |
| Check Battery                                |                   |     | x   |      |      |
| Replace Oil Filter                           |                   |     | x1  |      |      |
| Change Primary Fuel Filter                   |                   |     |     | x2   |      |
| Change Secondary Fuel Filter                 |                   |     |     |      | x2   |

### CRITICAL MAINTENANCE SCHEDULE

| MAINTENANCE ITEMS                              | OPERATIONAL HOURS |       |      |      |      |      |
|--|-------------------|-------|------|------|------|------|
|  | 200               | 500   | 1000 | 2000 | 3000 | 5000 |
| Check Breaker Points                           | x                 |       |      |      |      |      |
| Check Slip Rings                               | x1                |       |      |      |      |      |
| Check Brushes                                  | x4                |       |      |      |      |      |
| Check Valve Clearance *                        |                   | x 1/2 |      |      |      |      |
| Check Cooling System                           |                   |       | x    |      |      |      |
| Replace Fuel Filters                           |                   |       | x5   |      |      |      |
| Clean Generator                                |                   |       |      | x    |      |      |
| Grind Valves<br>(If Required)                  |                   |       |      | x    |      |      |
| Clean Rocker Box Oil<br>Line Holes             |                   |       |      | x    |      |      |
| Check Nozzle Opening<br>Pressure Spray Pattern |                   |       |      | x3   |      |      |
| General Overhaul<br>(If Required)              |                   |       |      |      |      | x    |

x - Perform as indicated in Table.

x1 - Perform more often in extremely dusty conditions.

x2 - Water or foreign material in the fuel can ruin the injection system. If daily inspection shows water or dust in the primary filter bowl, fuel handling and storage facilities should be checked and situation corrected. Filter elements should be replaced following corrections of fuel contamination problems.

x3 - This service must be conducted by trained diesel injection equipment personnel with suitable test facilities.

x4 - Replace collector ring brushes when worn to 5/16".

x5 - Service per Operator Maintenance Schedule.

x6 - With plant running visually and audibly check exhaust system for leaks.

\* - Tighten head bolts and adjust valve clearance after first 2 hours on a new or overhauled engine.

For critical items not covered, see page 2 (A Major Service Manual is available).

### BOLT TORQUES

FT-LB

|                             |       |
|-----------------------------|-------|
| Rocker Arm Nut              | 4-10  |
| Cylinder Head Bolt          | 44-46 |
| Flywheel Hub Bolt           | 17-21 |
| Flywheel Mounting Screw     | 65-70 |
| Fuel Pump Mounting Screw    | 15-20 |
| Gear Cover Mounting Screw   | 15-20 |
| Oil Base Mounting Screw     | 45-50 |
| Glow Plug                   | 10-15 |
| Injection Nozzle Mtg. Screw | 20-21 |
| Injection Pump Mtg. Nut     | 15-16 |
| Rear Bearing Plate          | 40-45 |
| Manifold Nuts               | 13-15 |
| Rocker Cover                | 8-10  |
| Generator Through Stud Nut  | 55-60 |

# **OPERATOR'S TROUBLE-SHOOTING GUIDE for ONAN DIESEL ENGINES**

| CAUSE              |   | TROUBLE                           |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|--------------------|---|-----------------------------------|----------------------------|-----------------|----------------|---------------|-------------------|---------------------|------------------|---------------------------|----------------------------|------------------|-------------------|-------------|
|                    |   | Hard Starting or Failure to Start | Starter Motor Doesn't Turn | Engine Misfires | Speed Too High | Speed Too Low | Hunting Condition | No Governor Control | Poor Sensitivity | Excessive Oil Consumption | Excessive Fuel Consumption | Low Oil Pressure | High Oil Pressure | Diluted Oil |
|                    |   |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
| COOLING SYSTEM     | Insufficient Coolant                      |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Faulty Thermostat                         |                                   |                            | •               |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Worn Water Pump                           |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Water Passages Restricted                 |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Damaged or Defective Water Pump Seals     |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Blown Head Gasket                         |                                   |                            | •               |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Overheating                               |                                   |                            |                 |                |               |                   |                     |                  | •                         |                            | •                |                   | •           |
|                    |   |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
| FUEL SYSTEM        | Inadequate Air Circulation (Ventilation)  |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    | Water Lines Restricted or Too Long        |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   | •           |
|                    |   |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Out of Fuel or Shut-off Valve Closed      | •                                 |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Poor Quality Fuel                         | •                                 |                            | •               |                |               |                   |                     |                  |                           | •                          |                  |                   | •           |
|                    | Dirty Fuel Filters                        | •                                 |                            | •               |                |               |                   |                     |                  |                           | •                          |                  |                   |             |
|                    | Fuel Line Leaks                           | •                                 |                            | •               |                | •             |                   |                     |                  |                           | •                          |                  |                   |             |
|                    | Air in Fuel System                        | •                                 |                            | •               |                | •             |                   |                     |                  |                           |                            |                  |                   |             |
| GOVERNOR SYSTEM    | Fuel Transfer Pump Diaphragm Leaks        |                                   |                            |                 |                |               |                   |                     |                  |                           | •                          |                  | •                 |             |
|                    | Incorrect Timing                          | •                                 |                            | •               |                |               |                   |                     |                  |                           | •                          |                  |                   | •           |
|                    | Run for Long Periods of Time at No Load   |                                   |                            |                 |                |               |                   |                     |                  | •                         |                            |                  |                   |             |
|                    | Restricted Air Intake, Dirty Air Filter   | •                                 |                            | •               |                |               |                   |                     |                  |                           | •                          |                  |                   |             |
|                    |   |                                   |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
| LUBRICATION SYSTEM | Linkage Loose or Disconnected             |                                   |                            |                 | •              | •             | •                 | •                   | •                |                           |                            |                  |                   |             |
|                    | Linkage Binding                           |                                   |                            |                 | •              | •             | •                 | •                   | •                |                           |                            |                  |                   |             |
|                    | Excessive Wear in Linkage                 |                                   |                            |                 |                |               | •                 | •                   | •                |                           |                            |                  |                   |             |
|                    | Incorrect Governor Adjustment             |                                   |                            |                 | •              | •             | •                 | •                   | •                |                           |                            |                  |                   |             |
|                    | Spring Sensitivity Too Great              |                                   |                            |                 |                |               | •                 | •                   |                  |                           |                            |                  |                   |             |
| STARTING SYSTEM    | Low Oil Supply                            |                                   |                            |                 |                |               |                   |                     |                  |                           | •                          |                  | •                 | •           |
|                    | Defective Gauge                           |                                   |                            |                 |                |               |                   |                     |                  |                           |                            | •                |                   |             |
|                    | Excess Oil in Crankcase                   |                                   |                            |                 |                |               |                   |                     |                  | •                         |                            |                  |                   |             |
|                    | Oil Leaks From Engine Base or Connections |                                   |                            |                 |                |               |                   |                     |                  | •                         |                            |                  |                   |             |
|                    | Crankcase Oil Too Light or Diluted        |                                   |                            |                 |                |               |                   |                     |                  | •                         | •                          |                  | •                 | •           |
|                    | Crankcase Oil Too Heavy                   | •                                 |                            |                 |                |               |                   |                     |                  |                           |                            | •                |                   |             |
| STARTING SYSTEM    | Battery Discharged or Defective           | •                                 | •                          |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Defective Glow Plug or Lead               | •                                 |                            | •               |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Load Connected When Starting              | •                                 |                            |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Open Solenoid                             | •                                 | •                          |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |
|                    | Defective Starter                         | •                                 | •                          |                 |                |               |                   |                     |                  |                           |                            |                  |                   |             |

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# PARTS CATALOG

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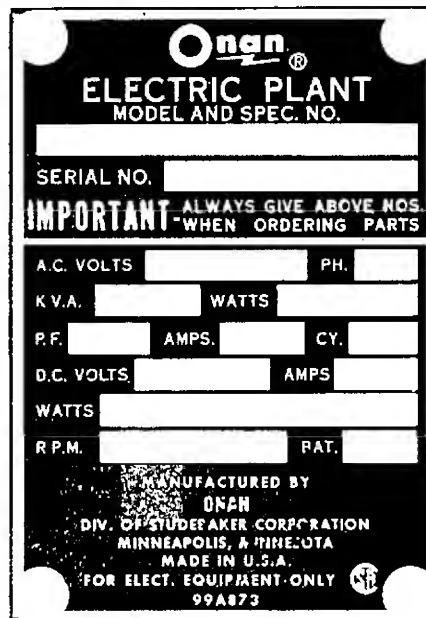
## INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Onan Parts and Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always refer to the nameplate on your unit:

1. Always give the MODEL and SPEC. NO. and SERIAL NO.



The image shows a rectangular nameplate form for Onan Electric Plant. At the top, the Onan logo is centered above the text "ELECTRIC PLANT". Below this, there are two lines for "MODEL AND SPEC. NO." and "SERIAL NO.". A bold section labeled "IMPORTANT" states "ALWAYS GIVE ABOVE NOS. WHEN ORDERING PARTS". Below this, there are several rows of input fields for technical specifications: "A.C. VOLTS", "PH.", "K.V.A.", "WATTS", "P.F.", "AMPS.", "CY.", "D.C. VOLTS", "AMPS", "WATTS", "R.P.M.", and "PAT.". At the bottom, it says "MANUFACTURED BY ONAN", "DIV. OF STUDEBAKER CORPORATION", "MINNEAPOLIS, MINN.", "MADE IN U.S.A.", "FOR ELECT. EQUIPMENT ONLY", and the number "99A873". There is also a small circular logo in the bottom right corner.

For handy reference, insert YOUR engine nameplate information in the spaces above.

2. Do not order by reference number or group number, always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older part cannot be identified, return the part prepaid to your dealer or nearest AUTHORIZED SERVICE STATION. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

Prices are purposely omitted from this Parts Catalog due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For current parts prices, consult your Onan Dealer, Distributor or Parts and Service Center.

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resulto de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extranjeros, etc."

Consiga los precios vigentes de su distribuidor de productos "ONAN".



This parts catalog applies to standard MDJE SERIES Generating Plants as listed in the Plant Data Table.

Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number in the Parts List for the group. Parts illustrations represent typical items and do not necessarily portray a particular part number.

Compare your plant nameplate MODEL and SPEC NO. with the Plant Data Table. Select the Parts Key No. (1, 2, in the last column) that applies to your plant Model and Spec No. This Parts Key No. appears in the description of parts that differ between models. Unless otherwise mentioned in the parts description, parts are interchangeable between the various models on which they are used as indicated by the quantity used column.

Right and left sides of the plant are determined by FACING the engine end (front) of the complete plant.

**PLANT DATA TABLE**

| MODEL<br>& SPEC ** | ELECTRICAL DATA |         |       |      |       | PARTS<br>KEY NO. |
|--------------------|-----------------|---------|-------|------|-------|------------------|
|                    | WATTS           | VOLTS   | CYCLE | WIRE | PHASE |                  |
| 7.5MDJE-3CR/*      | 7500            | 120/240 | 60    | ***  | 1     | 1                |
| 7.5MDJE-4R/*       | 7500            | 120/208 | 60    | 4    | 3     | 1                |
| 7.5MDJE-5DR/*      | 7500            | 120/240 | 60    | 4    | 3     | 1                |
| 6.0MDJE-53CR/*     | 6000            | 120/240 | 50    | ***  | 1     | 1                |
| 6.0MDJE-54R/*      | 6000            | 120/208 | 50    | 4    | 3     | 1                |
| 6.0MDJE-55DR/*     | 6000            | 120/240 | 50    | 4    | 3     | 1                |
| 7.5MDJE-3CR3/*££   | 7500            | 120/240 | 60    | ***  | 1     | 2                |
| 6.0MDJE-53CR3/*££  | 6000            | 120/240 | 50    | ***  | 1     | 2                |
| 7.5MDJE-3CR4/*£    | 7500            | 120/240 | 60    | ***  | 1     | 2                |
| 6.0MDJE-53CR4/*£   | 6000            | 120/240 | 50    | ***  | 1     | 2                |

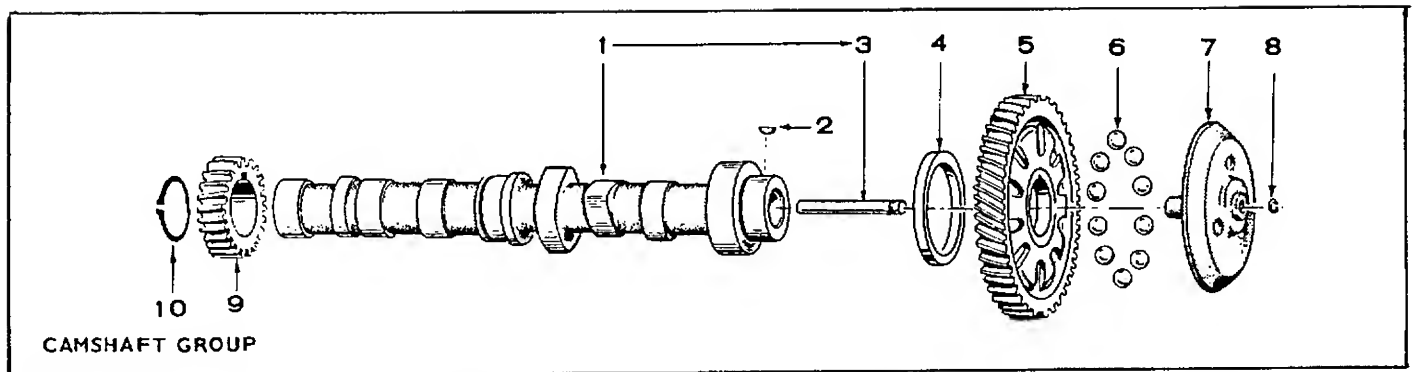
\* - The Specification Letter advances (A to B, B to C, etc.) with manufacturing changes.

\*\* - New model designations shown, begin during 1969. Previous designations used a zero in place of the decimal in the KW rating. EXAMPLE: 7.5MDJE was formerly 705MDJE and 6.0MDJE was formerly 6MDJE.

\*\*\* - These generators have four load wires which are reconnectable for 120-volt 2-wire service, or 240-volt 2-wire service, or 120-240-volt 3-wire service. NOTE: Previously the C was not used in the model designation.

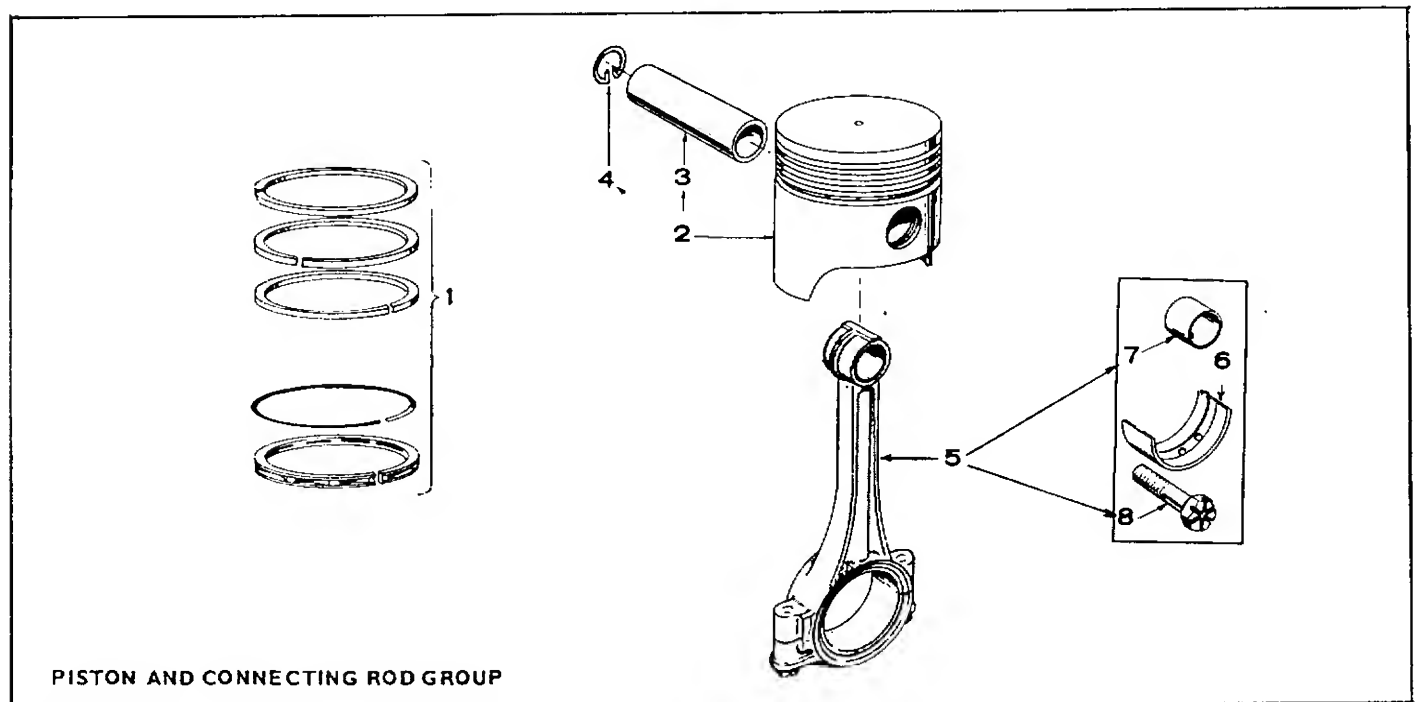
£ - These units have 32-volt dc system for engine requirements only (not auxiliary dc loads).

££ - These units have 24-volt dc system for engine requirements only (not auxiliary dc loads).



| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                             |
|----------|----------|-----------|--|
| 1        | 105C271  | 1         | Camshaft - Includes Center Pin               |
| 2        | 515-1    | 2         | Key, - Camshaft Gear or Inj. Pump Drive Gear |
| 3        | 150A75   | 1         | Pin, Center                                  |
| 4        | 105A205  | 1         | Washer, Thrust                               |
| 5        | 105B218  | 1         | Gear, Includes Flyball Spacer and Plate      |

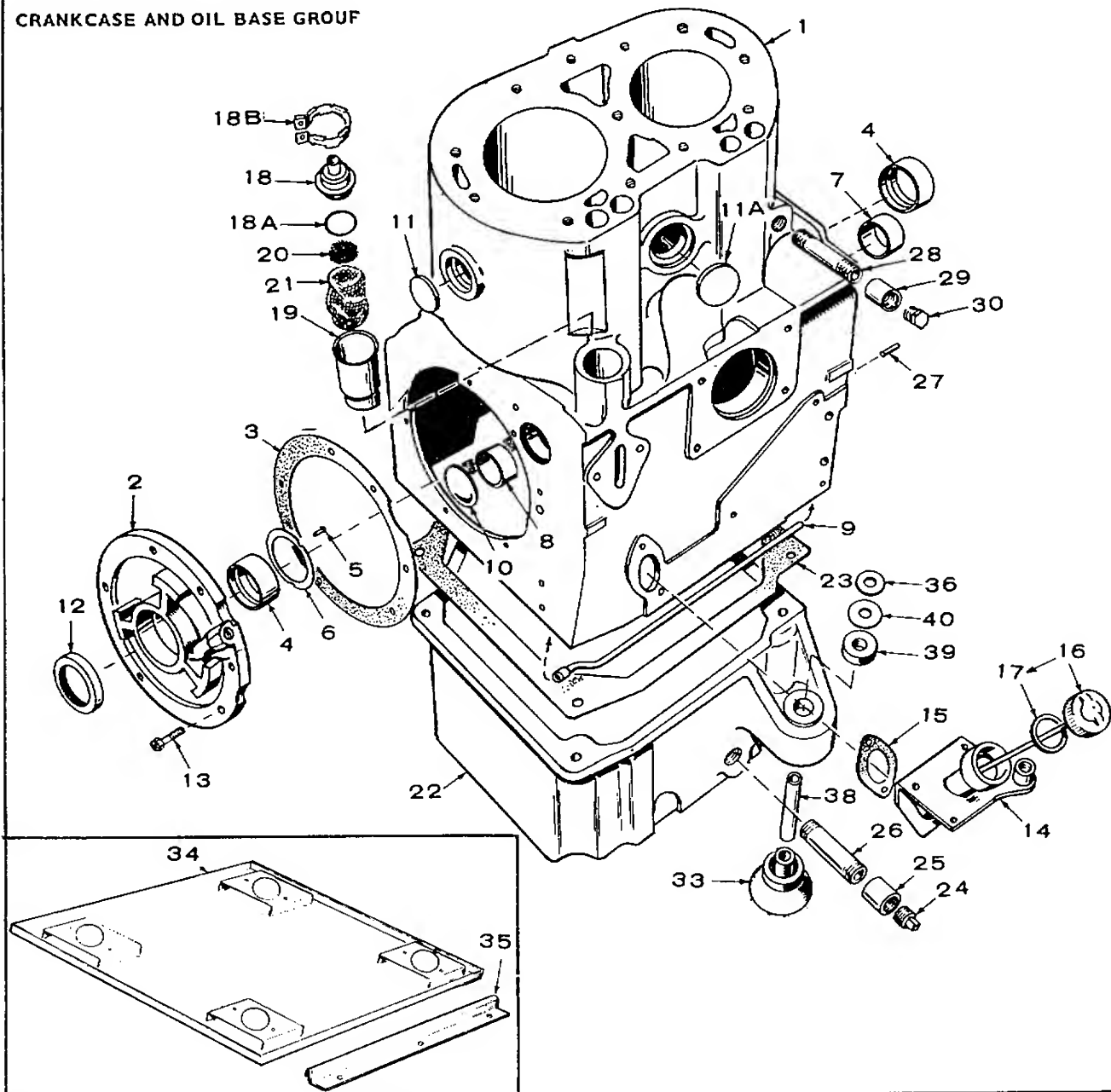
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION               |
|----------|----------|-----------|--------------------------------|
| 6        | 510-46   | 10        | Ball, Fly - Governor           |
| 7        | 150C775  | 1         | Cup, Governor                  |
| 8        | 150A78   | 1         | Ring, Snap - Center Pin        |
| 9        | 147B142  | 1         | Gear, Injection Pump Drive     |
| 10       | 518-195  | 1         | Ring, Ret. - Inj. Pump Dr. Gr. |



| REF. NO. | PART NO.                                      | QTY. USED | PART DESCRIPTION |
|----------|---|-----------|------------------|
| 1        | RING SET                                      |           |                  |
|          | 113A137                                       | 2         | Standard         |
|          | 113A137-05                                    | 2         | .005" Oversize   |
|          | 113A137-10                                    | 2         | .010" Oversize   |
|          | 113A137-20                                    | 2         | .020" Oversize   |
|          | 113A137-30                                    | 2         | .030" Oversize   |
|          | 113A137-40                                    | 2         | .040" Oversize   |
| 2        | PISTON AND PIN - INCLUDES PIN RETAINING RINGS |           |                  |
|          | 112-118                                       | 2         | Standard         |
|          | 112-118-05                                    | 2         | .005" Oversize   |
|          | 112-118-10                                    | 2         | .010" Oversize   |
|          | 112-118-20                                    | 2         | .020" Oversize   |
|          | 112-118-30                                    | 2         | .030" Oversize   |
|          | 112-118-40                                    | 2         | .040" Oversize   |

| REF. NO. | PART NO.                     | QTY. USED | PART DESCRIPTION                                     |
|----------|------------------------------|-----------|--|
| 3        | PIN, PISTON                  |           |  |
|          | 112A117                      | 2         | Standard   |
|          | 112A117-02                   | 2         | .002" Oversize                                       |
| 4        | 112A85                       | 4         | Ring, Retaining Pin                                  |
| 5        | 114B168                      | 2         | Rod Assembly, Connecting (Forged) Less Bearing       |
| 6        | BEARING HALF, CONNECTING ROD |           |  |
|          | 114B164                      | 4         | Standard   |
|          | 114B164-02                   | 4         | .002" Undersize                                      |
|          | 114B164-10                   | 4         | .010" Undersize                                      |
|          | 114B164-20                   | 4         | .020" Undersize                                      |
|          | 114B164-30                   | 4         | .030" Undersize                                      |
| 7        | 114A170                      | 4         | Bushing, Piston Pin - Connecting Rod (Semi-Finished) |
| 8        | 805A12                       | 4         | Bolt, Place - 5/16-24 x 1-13/16"                     |

# CRANKCASE AND OIL BASE GROUP



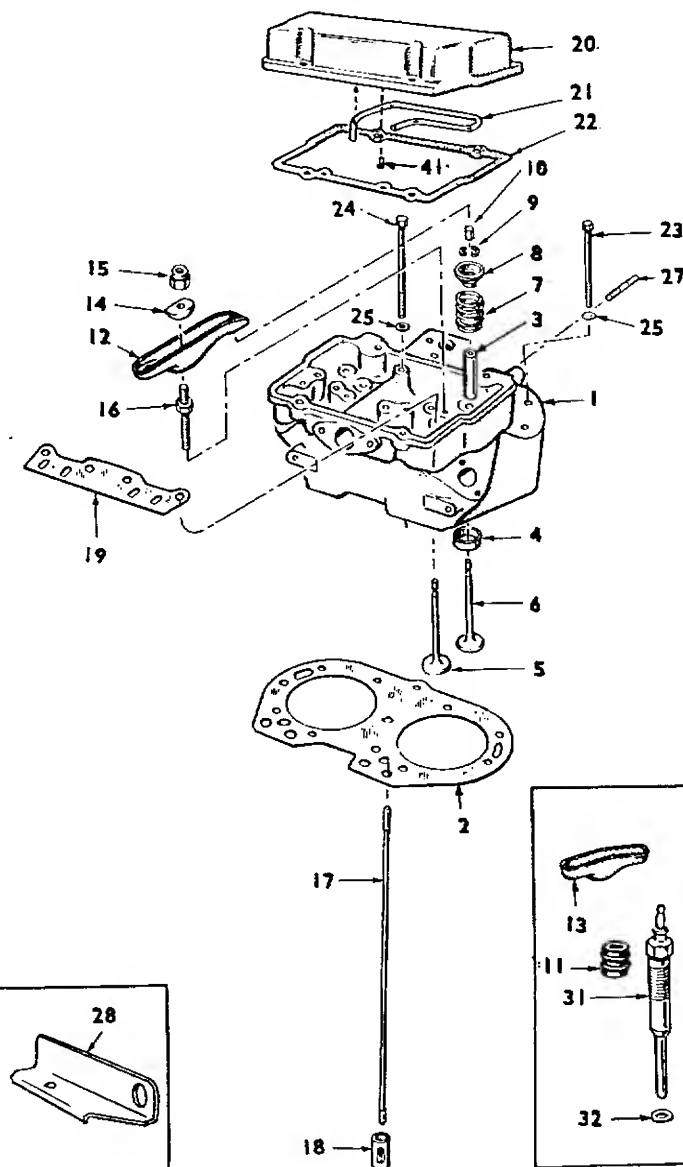
| REF. NO. | PART NO.                                 | QTY. USED | PART DESCRIPTION                                       |
|----------|--|-----------|--|
| 1        | 110A1664                                 | 1         | Block Assembly, Cylinder (Incl. Parts Marked *)        |
| 2        | 101D337                                  | 1         | *Plate, Bearing - Less Bearing and Pin                 |
| 3        | 101K386                                  | 1         | *Gasket Kit, Rear Bearing Plate (Includes Steel Shims) |
| 4        | BEARING, PRECISION, MAIN - FRONT OR REAR |           |  |
|          | 101B359                                  | 2         | Standard   |
|          | 101B359-02                               | 2         | .002" Undersize  |
|          | 101B359-10                               | 2         | .010" Undersize  |
|          | 101B359-20                               | 2         | .020" Undersize  |
|          | 101B359-30                               | 2         | .030" Undersize  |
| 5        | 516A72                                   | 4         | *Pin, Lock - Thrust Washer                             |
| 6        | 104A420                                  | 2         | *Washer, Crankshaft Thrust                             |
| 7        | 101B363                                  | 1         | *Bearing, Prec. Cam. - Frt. - Standard Only            |
| 8        | 101B365                                  | 1         | *Bearing, Prec. Cam. - Rear - Standard Only            |

| REF. NO. | PART NO.                    | QTY. USED | PART DESCRIPTION                                    |
|----------|-----------------------------|-----------|---|
| 9        | 120A553                     | 1         | *Tube, Crankcase Oil                                |
| 10       | 517-53                      | 1         | *Plug, Exp. - Rear Cam. Opening                     |
| 11       | 517-59                      | 3         | *Plug, Exp. - Cylinder Block (1-7/16")              |
| 11A      | 517P96                      | 1         | *Plug, Exp. - Cylinder Block (1-9/16")              |
| 12       | 509B86                      | 1         | Seal, Oil - Rear Bearing Plate                      |
| 13       | 805-19                      | 6         | *Bolt, Place - Rear Bearing Plate (3/8-16 x 1-1/4") |
| 14       | TUBE, OIL FILL              |           |   |
|          | 123A681                     | 1         | Prior to Spec B                                     |
|          | 123B1085                    | 1         | Begin Spec B  |
| 15       | 123A667                     | 1         | Gasket, Oil Fill Tube Mtg.                          |
| 16       | CAP AND INDICATOR, OIL FILL |           |   |
|          | 123A651                     | 1         | Prior to Spec B                                     |
|          | 123B1058                    | 1         | Begin Spec B  |
| 17       | 123A191                     | 1         | Gasket, Oil Fill Cap                                |

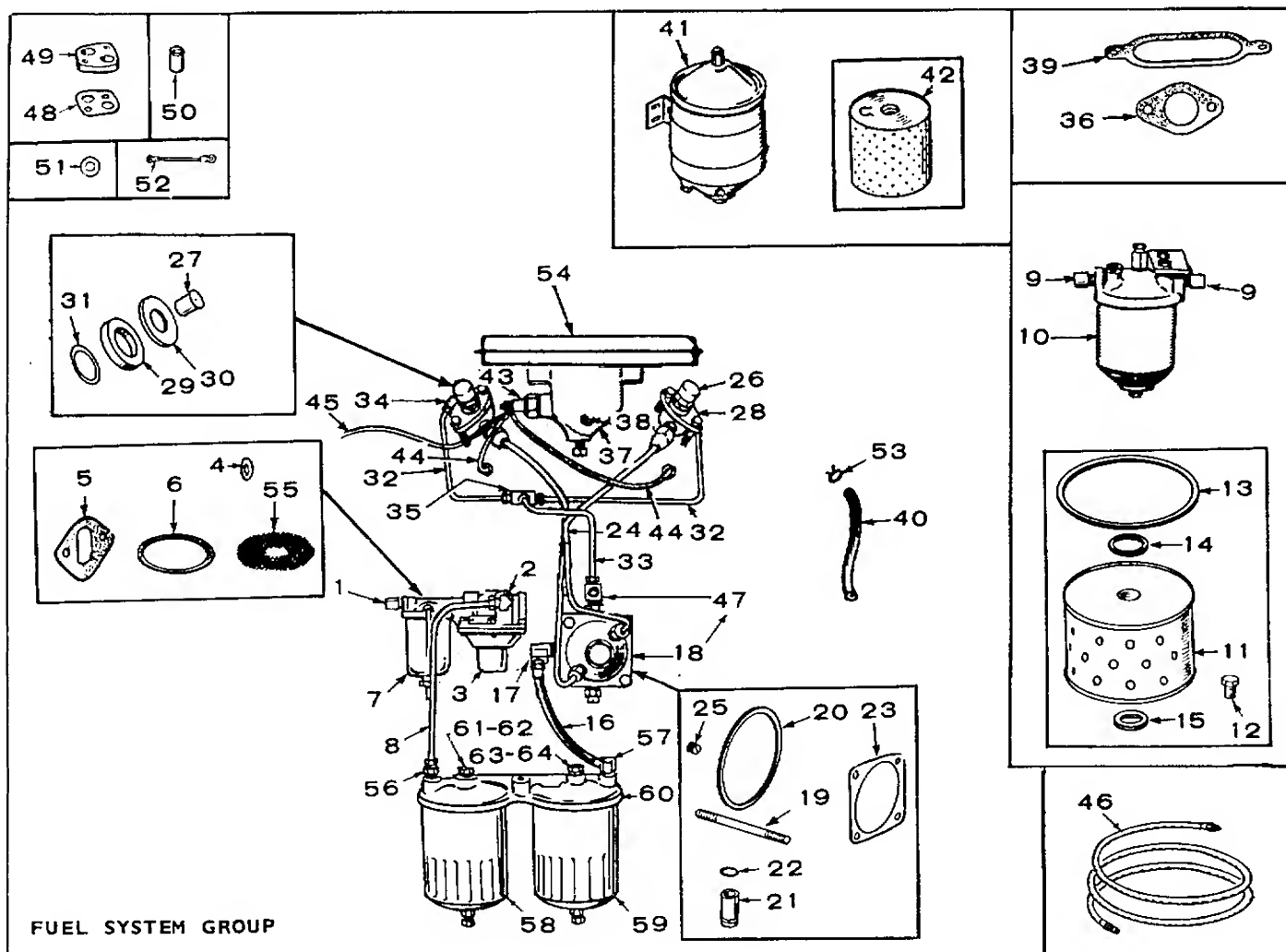
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                  |
|----------|----------|-----------|-----------------------------------|
| 18       | 123A954  | 1         | Cap and Valve, Breather Tube      |
| 18A      | 509-117  | 1         | Seal, "O" Ring - Breather Cap     |
| 18B      | 123A951  | 1         | Clamp, Breather Cap               |
| 19       | 123A952  | 1         | Tube, Breather                    |
| 20       | 123A958  | 1         | Screen, Breather                  |
| 21       | 123P865  | 1         | Baffle, Breather Tube             |
| 22       | 102D540  | 1         | Base, Oil                         |
| 23       | 102B451  | 1         | Gasket, Oil Base                  |
| 24       | 505-56   | 1         | Plug, 1/2"                        |
| 25       | 505-14   | 1         | Coupling, 1/2"                    |
| 26       | 505-2    | 1         | Nipple, 1/2"x3"                   |
| 27       | 516A141  | 2         | *Pin, Dowel - Gear Cover Locating |

| REF. NO. | PART NO.                         | QTY. USED | PART DESCRIPTION                       |
|----------|----------------------------------|-----------|--|
| 28       | 505-449                          | 1         | Nipple, 1/4 x 6"                       |
| 29       | 505-27                           | 1         | Coupling, 1/4"                         |
| 30       | 502-153                          | 1         | Plug, 1/4" Hex Head                    |
| 33       | CUSHION, VIBRATION - CONE SHAPED |           |  |
|          | 402B284                          | 2         | Engine End                             |
|          | 402B285                          | 2         | Generator End                          |
| 34       | 405C1402                         | 1         | Pan, Drip                              |
| 35       | 405C1265                         | 2         | Clamp, Drip Pan Hold-Down              |
| 36       | 526-14                           | 4         | Washer, Mtg. Rubber - Steel            |
| 38       | 402A290                          | 4         | Bushing, Cushion Mtg. Spacer           |
| 39       | 402A282                          | 4         | Snubber, Shock Mounting                |
| 40       | 526-198                          | As Req.   | Washer, (29/64" I.D. x 1-1/2" x 1/16") |

### CYLINDER HEAD, VALVE AND ROCKER BOX GROUP



| REF. NO. | PART NO.                                | QTY. USED | PART DESCRIPTION               |
|----------|---|-----------|--------------------------------|
| 1        | HEAD, CYLINDER                          |           |                                |
|          | 110B1274                                | 1         | Plants WITHOUT Heat Exchanger  |
|          | 110C1307                                | 1         | Plants WITH Heat Exchanger     |
| 2        | 110C1708                                | 1         | Gasket, Cylinder Head          |
| 3        | GUIDE, VALVE                            |           |                                |
|          | 110A1501                                | 4         | Standard                       |
|          | 110A1501-01                             | 4         | .001" Oversize                 |
| 4        | INSERT, VALVE SEAT - INTAKE AND EXHAUST |           |                                |
|          | 110A1268                                | 4         | Standard                       |
|          | 110A1268-02                             | 4         | .002" Oversize                 |
|          | 110A1268-05                             | 4         | .005" Oversize                 |
|          | 110A1268-10                             | 4         | .010" Oversize                 |
|          | 110A1268-25                             | 4         | .025" Oversize                 |
| 5        | 110B1320                                | 2         | Valve, Intake                  |
| 6        | 110B1278                                | 2         | Valve, Exhaust - Stellite      |
| 7        | 110A1221                                | 4         | Spring, Valve                  |
| 8        | 110B1220                                | 4         | Retainer, Valve Spring         |
| 9        | 110A858                                 | 8         | Lock, Valve Spring Retainer    |
| 10       | 110A859                                 | 4         | Cap, Valve Stem                |
| 11       | 509A90                                  | 2         | Seal Assy., Oil - Intake Valve |
|          |   |           | Includes Retainer Rings        |
| 12       | 115B128                                 | 2         | Arm, Rocker - Exhaust          |
| 13       | 115B129                                 | 2         | Arm, Rocker - Intake           |
| 14       | 115B127                                 | 4         | Ball, Rocker Arm               |
| 15       | 115B150                                 | 4         | Locknut, Hex - Rocker Arm      |
| 16       | 115A152                                 | 4         | Stud, Rocker Arm               |
| 17       | 115B149                                 | 4         | Rod, Valve Push - Steel        |
| 18       | 115A185                                 | 4         | Tappet, Valve                  |
| 19       | 115B142                                 | 1         | Guide, Push Rod                |
| 20       | 115D197                                 | 1         | Cover, Rocker                  |
| 21       | 120B628                                 | 1         | Line, Oil - Rocker Cover       |
| 22       | 115B130                                 | 1         | Gasket, Rocker Box             |
| 23       | 800A501                                 | 6         | Screw, 3/8-16 x 3-3/8"         |
| 24       | 110A1264                                | 5         | Screw, 3/8-16 x 4-1/4"         |
| 25       | 526-174                                 | 7         | Washer, Cyl. Head Screw        |
| 27       | 520A608                                 | 4         | Stud, Exhaust Manifold         |
| 28       | 403K707                                 | 1         | Kit, Lifting - Incl. Hdwe.     |
| 31       | PLUG, GLOW - INCLUDES GASKET            |           |                                |
|          | 333K106                                 | 2         | Key 1 (12-Volt)                |
|          | 333K112                                 | 2         | Key 2 (32-Volt)                |
|          | 333K107                                 | 2         | Key 2 (24-Volt)                |
| 32       | 110A546                                 | 2         | Gasket, Glow Plug              |
| 41       | 809-42                                  | 1         | Screw, Oil Line, Rocker Cover  |

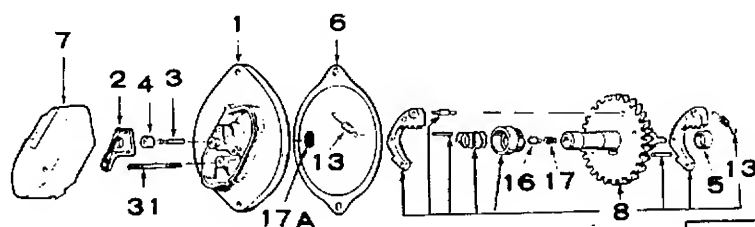
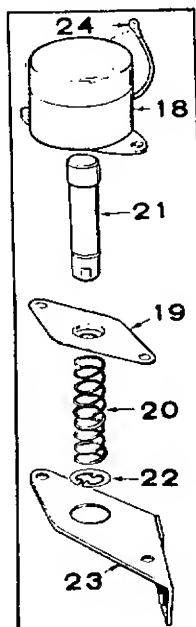


| REF. NO. | PART NO.                           | QTY. USED | PART DESCRIPTION                                       |
|----------|------------------------------------|-----------|--|
|          | 149P1046                           | 1         | Repair Kit, Fuel Pump (Includes Diaphragm and Gaskets) |
| 1        | ELBOW, INVERTED MALE - PUMP INLET  |           |  |
|          | 502-65                             | 1         | 45° - Prior to Spec B                                  |
|          | 502-2                              | 1         | 90° - Begin Spec B                                     |
| 2        | ELBOW, INVERTED MALE - PUMP OUTLET |           |  |
|          | 502-2                              | 1         | 90° - Prior to Spec B                                  |
|          | 502-65                             | 1         | 45° - Begin Spec B                                     |
| 3        | 149A1038                           | 1         | Pump, Fuel Transfer                                    |
| 4        | 526-65                             | 2         | Washer, Flat Copper                                    |
| 5        | 149A792                            | 1         | Gasket   |
| 6        | 149P517                            | 1         | Gasket, Fuel Pump Bowl                                 |
| 7        | 149-662                            | 1         | Bowl, Metal - Fuel Pump                                |
| 8        | LINE, PUMP TO FILTER               |           |  |
|          | 149B806                            | 1         | Prior to Spec B  |
|          | 149A1190                           | 1         | Begin Spec B   |
| 9        | 502-41                             | 2         | Elbow, Inv. Male - Inlet & Outlet - Prior to Spec B    |
| 10       | 149C408                            | 1         | Filter, Includes Cartridge - Prior to Spec B           |
| 11       | 149P428                            | 1         | Cartridge - Prior to Spec B                            |
| 12       | 149-769                            | 1         | Plug, Air Bleed - Prior to Spec B                      |
| 13       | 149P456                            | 1         | Gasket, Filter - Prior to Spec B                       |
| 14       | 149P455                            | 1         | Gasket, Secondary Filter - Prior to Spec B             |
| 15       | 149P493                            | 1         | Gasket, Secondary Filter - Prior to Spec B             |

| REF. NO. | PART NO.  | QTY. USED | PART DESCRIPTION                                 |
|----------|---|-----------|--|
| 16       | LINE, FUEL - SECONDARY FILTER TO INJECTION PUMP |           |  |
|          | 501A91  | 1         | Prior to Spec B                                  |
|          | 501A129   | 1         | Begin Spec B                                     |
| 17       | ELBOW, INJECTION PUMP INLET                     |           |  |
|          | 502-54  | 1         | Prior to Spec B                                  |
|          | 502-39  | 1         | Begin Spec B                                     |
| 18       | 147K219   | 1         | Pump, Fuel Injection (Includes Buttons 2, 4, 12) |
| 19       | 520A129   | 4         | Stud, Injection Pump Mounting                    |
| 20       | 509P94  | 1         | Seal, "O" Ring                                   |
| 21       | 147A182   | 1         | Tappet, Injection Pump                           |
| 22       | 147-196   | 1         | Gasket, "O" Ring, Injection Pump Tappet          |
| 23       | 147K145   | 1         | Shim Kit, Injection Pump                         |
| 24       | LINE, INJECTION PUMP TO NOZZLE                  |           |  |
|          | 149C1101  | 1         | #1 Cylinder                                      |
|          | 149C1102  | 1         | #2 Cylinder                                      |
| 25       | BUTTON, INJECTION PUMP PLUNGER                  |           |  |
|          | 147A147   | 1         | .119 - Marked 1 or A                             |
|          | 147A148   | 1         | .116 - Marked 2 or B                             |
|          | 147A149   | 1         | .113 - Marked 3 or C                             |
|          | 147A150   | 1         | .110 - Marked 4 or D                             |
|          | 147A151   | 1         | .107 - Marked 5 or E                             |
|          | 147A161   | 1         | .104 - (Std.) 11 or No Mark                      |
|          | 147A152   | 1         | .101 - Marked 6 or F                             |
|          | 147A153   | 1         | .098 - Marked 7 or H                             |

| REF.<br>NO. | PART<br>NO.              | QTY.<br>USED | PART<br>DESCRIPTION   |
|-------------|--------------------------|--------------|---|
|             | 147A154                  | 1            | .095 - Marked 8 or J  |
|             | 147A155                  | 1            | .092 - Marked 9 or K  |
|             | 147A156                  | 1            | .089 - Marked 10 or L   |
|             | 147A190                  | 1            | .122 - Marked 12 or M   |
|             | 147A189                  | 1            | .125 - Marked 13 or N   |
|             | 147A188                  | 1            | .128 - Marked 14 or P   |
|             | 147A187                  | 1            | .131 - Marked 15 or R   |
|             | 147A186                  | 1            | .134 - Marked 16 or S   |
| 26          | 147B136                  | 2            | Nozzle and Holder Assy.   |
| 27          | 147P134                  | 2            | Nozzle Only - Component of<br>Nozzle and Holder Assy                          |
| 28          | 147A141                  | 2            | Flange, Injection Nozzle<br>Hold-down   |
| 29          | 147A44                   | 4            | Shield, Nozzle Heat   |
| 30          | 147A43                   | 2            | Gasket, Nozzle Heat Shield  |
| 31          | 110A419                  | 2            | Gasket, Shield to Head  |
| 32          | LINE, NOZZLE FUEL RETURN |              |   |
|             | 149B1056                 | 1            | #1 Cylinder (15-1/4")   |
|             | 149A1057                 | 1            | #2 Cylinder (12-1/2")   |
| 33          | 149A1058                 | 1            | Line, Inj. Pump to Fuel<br>Return Lines Tee                                   |
| 34          | 502-65                   | 2            | Elbow, Street - Nozzle (Fuel<br>Return Line) - 45°                            |
| 35          | 502-102                  | 1            | Tee, Nozzle Return Lines  |
| 36          | 141A281                  | 1            | Gasket, Resonator   |
| 37          | ADAPTER, RESONATOR       |              |   |
|             | 140C804                  | 1            | Key 1   |
|             | 140B816                  | 1            | Key 2, 32-Volt  |
|             | 140B817                  | 1            | Key 2, 24 Volt  |
| 38          | 505-180                  | 1            | Plug, 1/4" - Resonator<br>Adapter - Used on some<br>early models.             |
| 39          | 140A584                  | 1            | Gasket, Resonator   |
| 40          | 503B557                  | 1            | Hose, Breather Cap to<br>Resonator  |
| 41          | 149C1078                 | 1            | Filter, Fuel - Mtd. Between<br>Fuel Tank & Transfer Pump<br>- Prior to Spec B |
| 42          | 149P846                  | 1            | Cartridge - For 149C1078<br>Filter - Prior to Spec B                          |

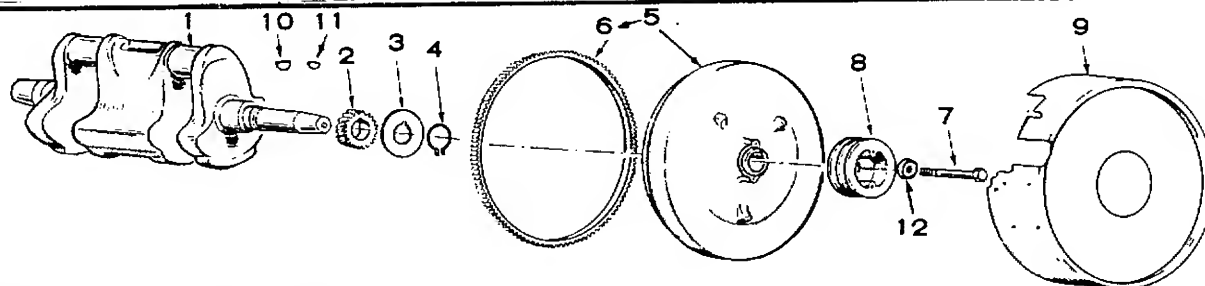
| REF.<br>NO. | PART<br>NO.                   | QTY.<br>USED | PART<br>DESCRIPTION   |
|-------------|-------------------------------|--------------|---|
| 43          | HEATER, MANIFOLD - 12 VOLT    |              |   |
|             | 154P712                       | 1            | Key 1   |
|             | 154P712                       | 3            | Key 2, 32 Volt  |
|             | 154P712                       | 2            | Key 2, 24 Volt  |
| 44          | LEAD, GLOW PLUG TO AIR HEATER |              |   |
|             | 336A1505                      | 1            | #2 Cylinder (5-1/4")  |
|             | 336A1504                      | 1            | #1 Cylinder (12-1/4")   |
| 45          | 336A1418                      | 1            | Lead, Air Heater to Heater<br>Solenoid in Control               |
| 46          | 501A7                         | 2            | Line, Flexible - 24"  |
| 47          | 147P183                       | 1            | Valve, Bleeder - Inj. Pump                                      |
| 48          | 140A706                       | 1            | Gasket, Heater Adapter Key 2                                    |
| 49          | 140A705                       | 1            | Plate, Heater Adapter Key 2                                     |
| 50          | 508A103                       | 2            | Sleeve, Mica - Heater Adapter<br>Mounting Key 2                 |
| 51          | 508A102                       | 2            | Washer, Mica - Heater Adapter<br>Key 2                          |
| 52          | 336A1051                      | 1            | Lead, Jumper - Air Heater<br>Key 2                              |
| 53          | 503A170                       | 2            | Clamp, Breather Hose  |
| 54          | 140B803                       | 1            | Resonator   |
| 55          | 149P463                       | 1            | Screen, Fuel Transfer Pump                                      |
| 56          | 502-3                         | 1            | Connector, Primary Fuel Filter<br>Inlet - Begin Spec B          |
| 57          | 502-99                        | 1            | Elbow, Reducer - Secondary Fuel<br>Filter Outlet - Begin Spec B |
| 58          | 122B325                       | 1            | Filter, Fuel - Primary -<br>Begin Spec B                        |
| 59          | 122B326                       | 1            | Filter, Fuel - Secondary - Begin<br>Spec B                      |
| 60          | 149D1185                      | 1            | Adapter, Fuel Filters - Begin<br>Spec B                         |
| 61          | 526-68                        | 1            | Washer, Primary Fuel Filter<br>Mounting - Begin Spec B          |
| 62          | 801-74                        | 1            | Screw, Hex Cap - Primary Fuel<br>Filter Mtg. - Begin Spec B     |
| 63          | 526-66                        | 1            | Washer, Secondary Fuel Filter<br>Mounting - Begin Spec B        |
| 64          | 801-53                        | 1            | Screw, Hex Cap - Secondary Fuel<br>Filter Mtg. - Begin Spec B   |



START-DISCONNECT PLATE AND STOP SOLENOID GROUP

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION  |
|----------|----------|-----------|---|
| 1        | 191A496  | 1         | Plate, Centrifugal Switch   |
| 2        | 309A134  | 1         | Switch Assy. Centrifugal  |
| 3        | 309A152  | 1         | Plunger, Switch   |
| 4        | 160A263  | 1         | Diaphragm, Switch Plgr.   |
| 5        | 160A721  | 1         | Spacer, Switch Plate and/or Brg. Plate  |
| 6        | 160A721  | 1         | Gasket, Switch Plate and/or Brg. Plate  |
| 7        | 191B392  | 1         | Cover, Plate  |
| 8        | 191B554  | 1         | Control Assy., Start-Disc. Switch (Also Drive Water Pump) Includes Weight Springs |
| 13       | 160A711  | 2         | Spring, Weight - Incl. in Cont. Assy.   |

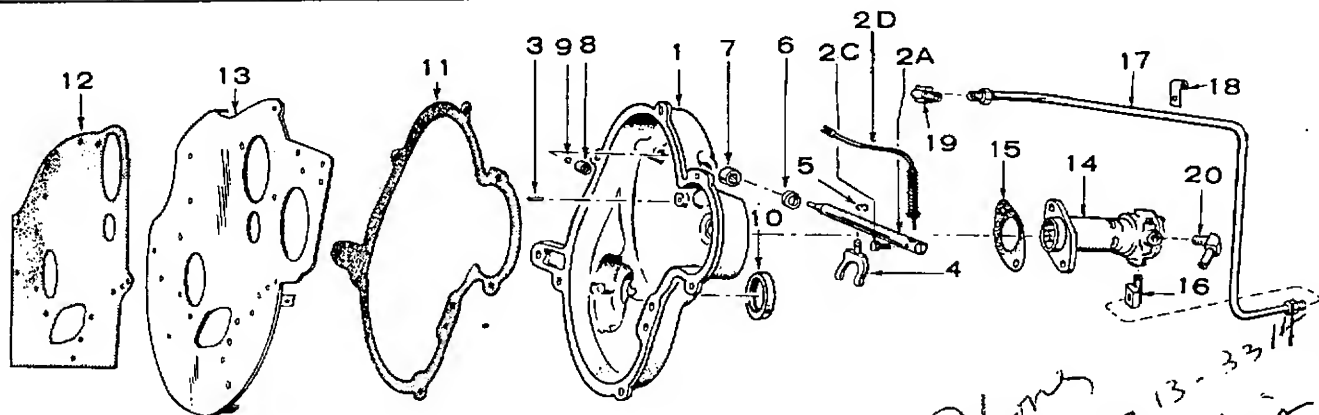
| REF. NO. | PART NO.           | QTY. USED | PART DESCRIPTION                          |
|----------|--------------------|-----------|---|
| 16       | 160A774            | 1         | Plunger, Thrust                           |
| 17       | 160A773            | 1         | Spring, Thrust Plunger                    |
| 17A      | 160A806            | 1         | Disc, Thrust Plunger                      |
| 18       | SOLENOID, STOPPING |           |   |
|          | 307B628            | 1         | Key 1                                     |
|          | 307B680            | 1         | Key 2, 32-Volt                            |
|          | 307B668            | 1         | Key 2, 24-Volt                            |
| 19       | 306A162            | 1         | Retainer, Sol. Plunger                    |
| 20       | 306A161            | 1         | Spring, Sol. Plunger                      |
| 21       | 306A159            | 1         | Plunger, Solenoid                         |
| 22       | 518-203            | 1         | Ring, Snap - Spring Retaining             |
| 23       | 306B158            | 1         | Bracket, Solenoid                         |
| 24       | 336A706            | 1         | Lead, Solenoid Ground                     |
| 29       | 338B258            | 1         | Harness, Wiring - Switch Plate to Control |
| 31       | 520A347            | 1         | Stud, Switch Plate Cover                  |



CRANKSHAFT & FLYWHEEL GROUP

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                   |
|----------|----------|-----------|------------------------------------|
| 1        | 104B451  | 1         | Crankshaft                         |
| 2        | 104B418  | 1         | Gear, Crankshaft                   |
| 3        | 104A416  | 1         | Washer, Retainer                   |
| 4        | 518-188  | 1         | Ring, Lock                         |
| 5        | 104B448  | 1         | Flywheel - Includes Ring Gear      |
| 6        | 104B423  | 1         | Gear, Flywheel Ring                |
| 7        | 800A500  | 1         | Screw, 7/16-14 x 5-1/2" - Flywheel |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION  |
|----------|----------|-----------|---|
| 8        | 104C550  | 1         | Pulley, Flywheel - For Plts with Heat Exchanger or Keel Cooling |
| 9        | 104D444  | 1         | Guard, Flywheel   |
| 10       | 515-1    | 1         | Key, Gear Mtg.  |
| 11       | 515-153  | 1         | Key, Flywheel to Crankshaft                                     |
| 12       | 526A185  | 1         | Washer, Flywheel Mtg  |



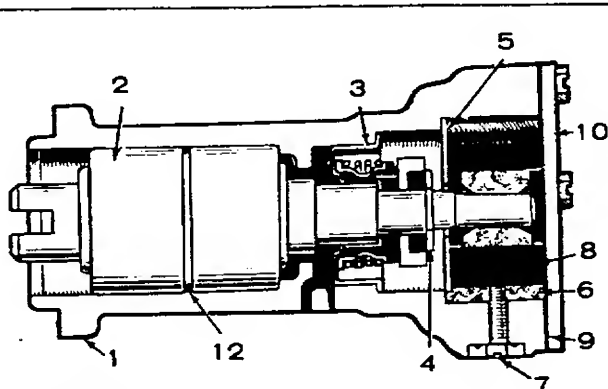
### GEAR COVER AND WATER PUMP GROUP

NOTE: For plants with heat exchanger or keel cooling see separate group.

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                                      |
|----------|----------|-----------|---|
| 1        | 103C267  | 1         | Cover Assembly, Gear, - Complete Incl. Parts Marked * |
| 2A       | 150B838  | 1         | *Shaft, Governor                                      |
| 2C       | 815-176  | 1         | *Screw, #8-32 x 1/2"                                  |
| 2D       | 150B1095 | 1         | Arm, Governor   |
| 3        | 516-111  | 1         | *Pin, Roll - Gov. Cup Stop                            |
| 4        | 150A777  | 1         | *Yoke   |
| 5        | 518-129  | 1         | *Ring, Yoke Retaining - "E" Shaped                    |
| 6        | 509P88   | 1         | *Seal, Oil - Gov. Shaft                               |
| 7        | 501P48   | 1         | *Bearing, Needle - Gov. Shaft For 1/2" Shaft          |
| 8        | 510P82   | 1         | *Bearing, Needle - Gov. Shaft For 1/4" Shaft          |
| 9        | 510-43   | 1         | *Ball, Bearing - Gov. Shaft Thrust                    |
| 10       | 509-87   | 1         | *Seal, Oil - Gear Cover                               |

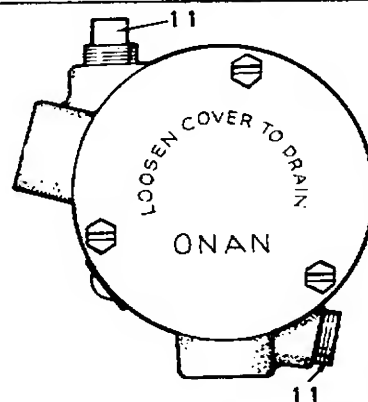
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION  |
|----------|----------|-----------|---|
| 11       | 103B251  | 1         | Gasket, Gear Cover  |
| 12       | 103C218  | 1         | Gasket, Backplate   |
| 13       | 103D228  | 1         | Backplate, Gear Cover                                     |
| 14       | 131B152  | 1         | Pump, Water (For Component Parts Refer To Separate Group) |
| 15       | 131A127  | 1         | Gasket, Water Pump Mtg.                                   |
| 16       | 502-76   | 1         | Elbow, Inv. Male - Water Pump Outlet                      |
| 17       | 130B628  | 1         | Line, Water - Pump to Block                               |
| 18       | 130A511  | 1         | Clamp, Water Line   |
| 19       | 502-74   | 1         | Elbow, Inv. Male - Water Line to Block                    |
| 20       | 502P304  | 1         | Elbow, Water Pump Inlet                                   |

\* - Contained in Gear Cover Assembly.



### WATER PUMP PARTS GROUP (131B152)

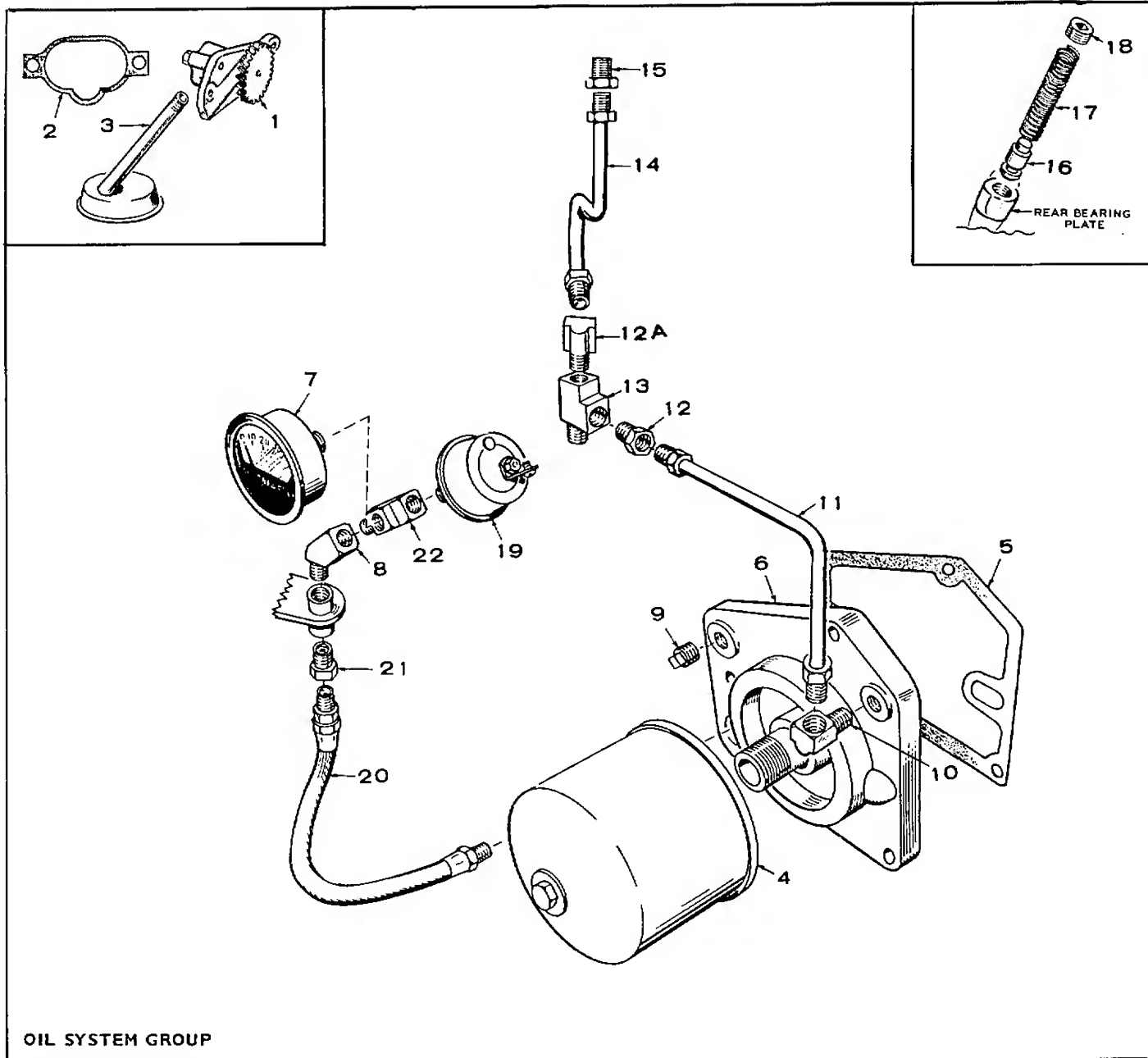
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                              |
|----------|----------|-----------|---|
|          | 131K179  | 1         | Kit, Water Pump Repair - Incl. Parts Marked * |
| 1        |          | 1         | Body, Water Pump (Not Sold Separately)        |
| 2        | 131A154  | 1         | Bearing and Shaft Assy.                       |
| 3        | 131P157  | 1         | *Seal Assembly                                |
| 4        | 518P221  | 1         | *Retaining Ring                               |
| 5        | 131A158  | 1         | *Wear Plate, Rear                             |
| 6        | 131C159  | 1         | *Cam - Impeller                               |



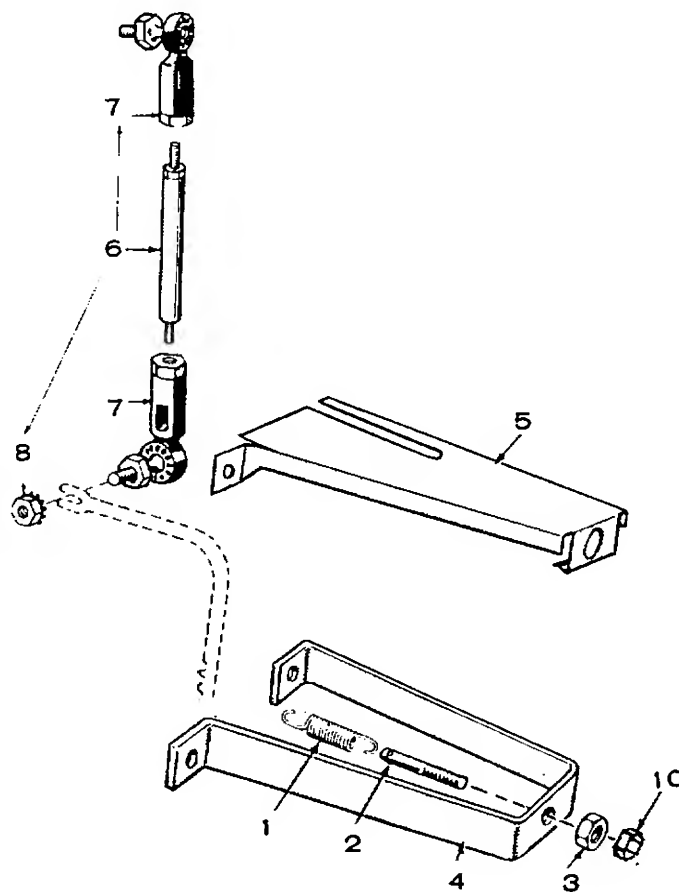
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                      |
|----------|----------|-----------|---------------------------------------|
| 7        | 815-283  | 4         | Screw, H.H. Brass (1) * Cam (3) Cover |
| 8        | 131P160  | 1         | *Impeller                             |
| 9        | 131A161  | 1         | *Gasket, Cover                        |
| 10       | 131A162  | 1         | *Cover, Pump                          |
| 11       | 502-80   | 2         | Plug, Square Head (1/8")              |
| 12       | 509-113  | 1         | "O" Ring                              |

\* - Contained in Repair Kit.



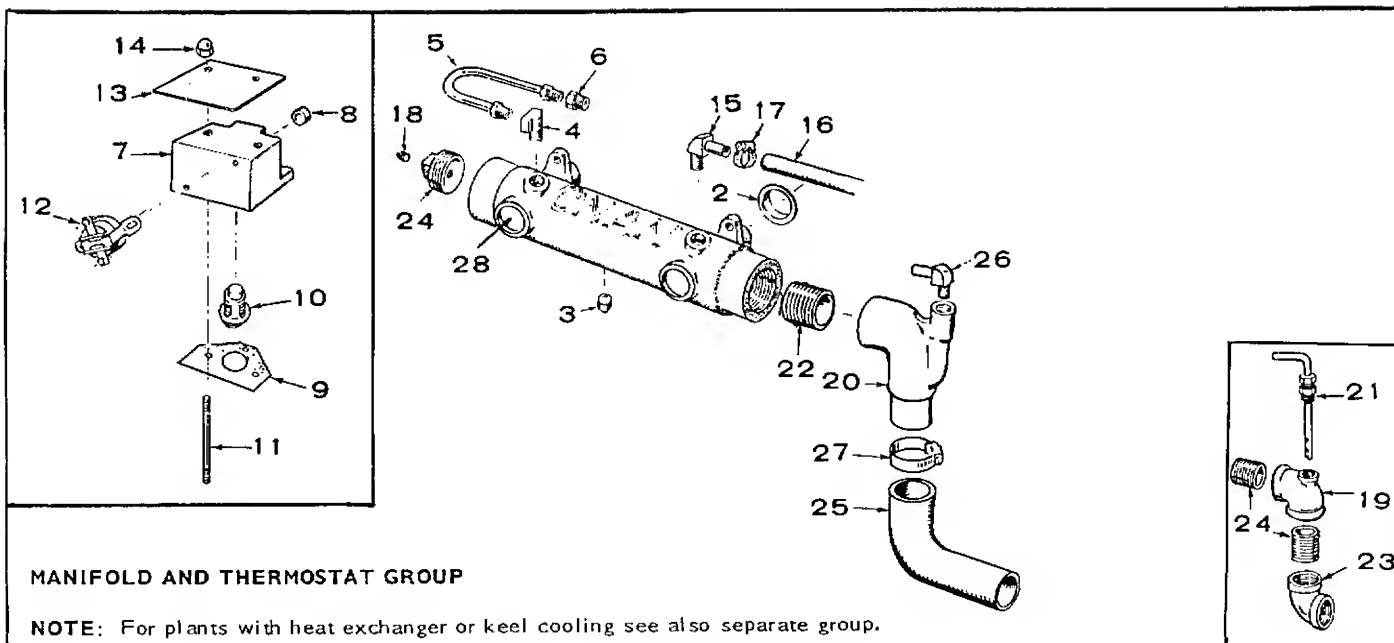


| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION   | REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                                       |
|----------|----------|-----------|--|----------|----------|-----------|--|
| 1        | 120B547  | 1         | Pump Assembly, Oil   | 13       | 502A242  | 1         | Tee, Restricted - Inj. Pump Lub.                       |
| 2        | 120K580  | 1         | Gasket Kit, Oil Pump                                       | 14       | 120A631  | 1         | Line, Oil - Inj. Pump Tee to Cyl. Head                 |
| 3        | 120A551  | 1         | Cup Assy., Oil Pump Intake                                 | 15       | 502A281  | 1         | Connector, Restricted - Oil Line to Cylinder Head      |
| 4        | 122A185  | 1         | Filter, Oil  | 16       | 120A539  | 1         | Valve, Oil By-Pass                                     |
| 5        | 122A188  | 1         | Gasket, Filter Adapter                                     | 17       | 120A555  | 1         | Spring, By-Pass Valve                                  |
| 6        | 122A182  | 1         | Adapter Assy., Filter                                      | 18       | 505-274  | 1         | Plug, Oil By-Pass                                      |
| 7        | 193P6    | 1         | Gauge, Oil Pressure  | 19       | 309A169  | 1         | Switch, Low Oil Pressure Cut-Off                       |
| 8        | 502A53   | 1         | Elbow, Street - 45° (NOTE: Qty. of 2 Used Prior to Spec B) | 20       | 501A3    | 1         | Line, Oil - Begin Spec B                               |
| 9        | 505-57   | 1         | Plug, 1/8" - Filter Adapter                                | 21       | 502-3    | 1         | Connector, Oil Fill Bracket to Oil Line - Begin Spec B |
| 10       | 502-37   | 1         | Elbow, Inv. Male - Oil Line to Oil Filter Adapter          | 22       | 502-58   | 1         | Tee, Oil Fill Bracket to Gauge & Switch - Begin Spec B |
| 11       | 120A636  | 1         | Line, Oil - Adapter to Tee                                 |          |          |           |  |
| 12       | 502A274  | 1         | Connector, Restricted                                      |          |          |           |  |
| 12A      | 502-37   | 1         | Elbow, Injection Pump to Lub. Tee                          |          |          |           |  |



GOVERNOR GROUP

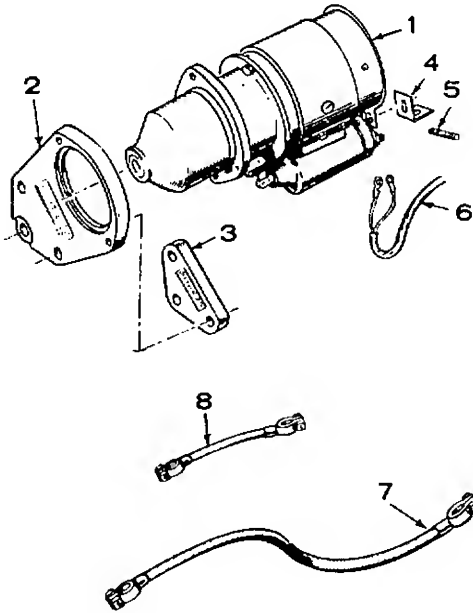
| REF.<br>NO. | PART<br>NO. | QTY.<br>USED | PART<br>DESCRIPTION      |
|-------------|-------------|--------------|--------------------------|
| 1           | 150A1084    | 1            | Spring, Governor         |
| 2           | 150A1082    | 1            | Stud, Adjusting          |
| 3           | 862-3       | 1            | Nut, Governor Adjusting  |
| 4           | 150A1103    | 1            | Bracket, Governor Spring |
| 5           | 150B823     | 1            | Cover, Governor Spring   |
| 6           | 150A1132    | 1            | Linkage Assy., Governor  |
| 7           | 150A939     | 2            | Joint, Ball              |
| 8           | 870-131     | 2            | Nut, Keps                |
| 10          | 870-130     | 1            | Palnut, Gov. Adj. Lock   |



| REF. NO. | PART NO.          | QTY. USED | PART DESCRIPTION   |
|----------|-------------------|-----------|--|
| 1        | 154D708           | 1         | Manifold, Exhaust - Water Cooled                                 |
| 2        | 154A1057          | 2         | Gasket, Exhaust Manifold to Head                                 |
| 3        | 505-110           | 1         | Plug, 3/8"   |
| 4        | 502-74            | 1         | Elbow, Inverted Male   |
| 5        | 130A510           | 1         | Line, Water  |
| 6        | 502-103           | 1         | Connector, Inverted Male - Thermostat Cover Outlet               |
| 7        | COVER, THERMOSTAT |           |  |
|          | 309B144           | 1         | Plants WITHOUT Keel Cooling                                      |
|          | 309A161           | 1         | Plants WITH Keel Cooling   |
| 8        | 505-274           | 1         | Plug, 1/8" Thermostat Cover                                      |
| 9        | 309A145           | 1         | Gasket, Thermostat Cover   |
| 10       | 309B130           | 1         | Thermostat   |
| 11       | 520A143           | 2         | Stud, Thermostat Cover   |
| 12       | 309A156           | 1         | Switch, Hi-Temp. Cut-Off   |
| 13       | 309A154           | 1         | Cover, Thermostat Switch - For Plants with Switch Mtd. on Cover. |
| 14       | 869-2             | 2         | Nut, Acorn - 5/16-24 Thermostat Cover Stud                       |
| 15       | 502-237           | 1         | Elbow, Brass - Exhaust Manifold Water Outlet                     |

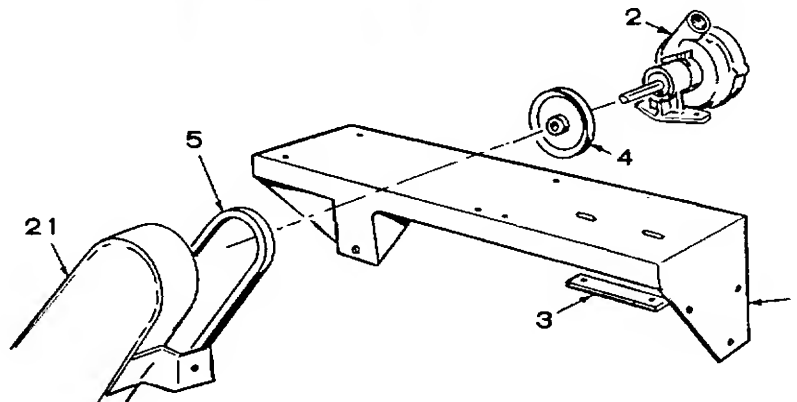
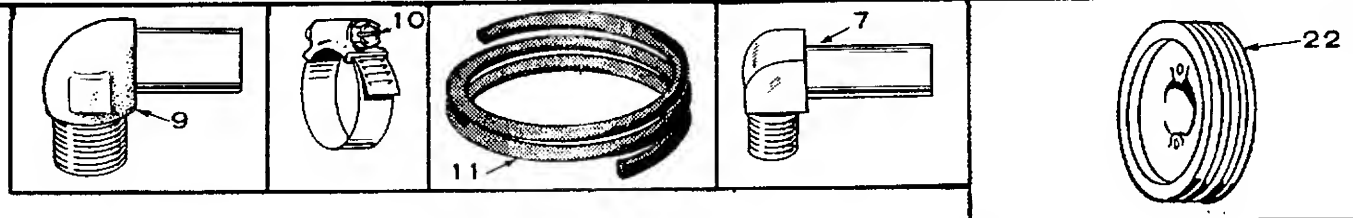
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION   |
|----------|----------|-----------|--|
| 16       | 503-159  | 1         | Hose, Rubber (1/2 x 34) - Water Outlet and Inlet                                       |
| 17       | 503-446  | 2         | Clamp, Water Hose  |
| 18       | 502-80   | 1         | Plug (1/8") - Manifold End Cap TEE, REDUCING - EXHAUST (WITH PROVISION FOR WATER LINE) |
| 19       | 505-485  | 1         | Early Models   |
| 20       | 155C1058 | 1         | Late Models  |
| 21       | 154B894  | 1         | Tube Assembly, Water Hose Adapter - Early Models                                       |
| 22       | 505-625  | 1         | Nipple, Close (1-1/4") - Exhaust (Early Models Used Qty. of 2)                         |
| 23       | 505-493  | 1         | Elbow, Pipe (1-1/4" x 90°) - Exhaust - Early Models                                    |
| 24       | 505A490  | 1         | Plug, Exhaust Manifold End   |
| 25       | 503A575  | 1         | Elbow, Exhaust Hose - Late Models  |
| 26       | 502-237  | 1         | Elbow, Brass - Water Hose Adapter - Late Models  |
| 27       | 503P465  | 2         | Clamp, Hose - Exhaust Elbow - Late Models  |
| 28       | 517-41   | 3         | Plug, Expansion  |

# **AUTOMOTIVE STARTER GROUP**



\* - For Starter Components not listed, check starter name-plate and contact nearest dealer.

| REF. NO. | PART NO.                          | QTY. USED | PART DESCRIPTION                   |
|----------|-----------------------------------|-----------|------------------------------------|
| 1        | *MOTOR STARTER                    |           |                                    |
|          | 191C324                           | 1         | Key 1, (12-Volt)                   |
|          | 191A443                           | 1         | Key 2 (24-32-Volt)                 |
| 2        | 191C512                           | 1         | Flange, Starter                    |
| 3        | 191A311                           | 1         | Spacer, Starter Flange             |
| 4        | 191A365                           | 1         | Bracket, Starter Support           |
| 5        | 520A624                           | 1         | Stud, Batt. Cable Grd.             |
| 6        | 338B279                           | 1         | Harness Assy. - Starter to Control |
| 7        | CABLE, BATTERY (SELECT BY LENGTH) |           |                                    |
|          | 416A21                            | 2         | 20-1/2" Long                       |
|          | 416A77                            | 2         | 28-1/4" Long                       |
| 8        | 416A4                             | 1         | Cable, Battery Jumper              |
|          | CLUTCH, STARTER                   |           |                                    |
|          | 191-432                           | 1         | For 12-Volt                        |
|          | 191-432                           | 1         | For 24-Volt                        |
|          | SWITCH, START SOLE. - STARTER     |           |                                    |
|          | 191-433                           | 1         | For 12-Volt                        |
|          | 191-715                           | 1         | For 24-Volt                        |
|          | BRUSH SET - STARTER               |           |                                    |
|          | 191-434                           | 1         | For 12-Volt                        |
|          | 191-714                           | 1         | For 24-Volt                        |
|          | ARMATURE, STARTER                 |           |                                    |
|          | 191P712                           | 1         | For 12-Volt                        |
|          | 191P713                           | 1         | For 24-Volt                        |
|          | 191-497                           | 1         | Bearing, Drive End                 |

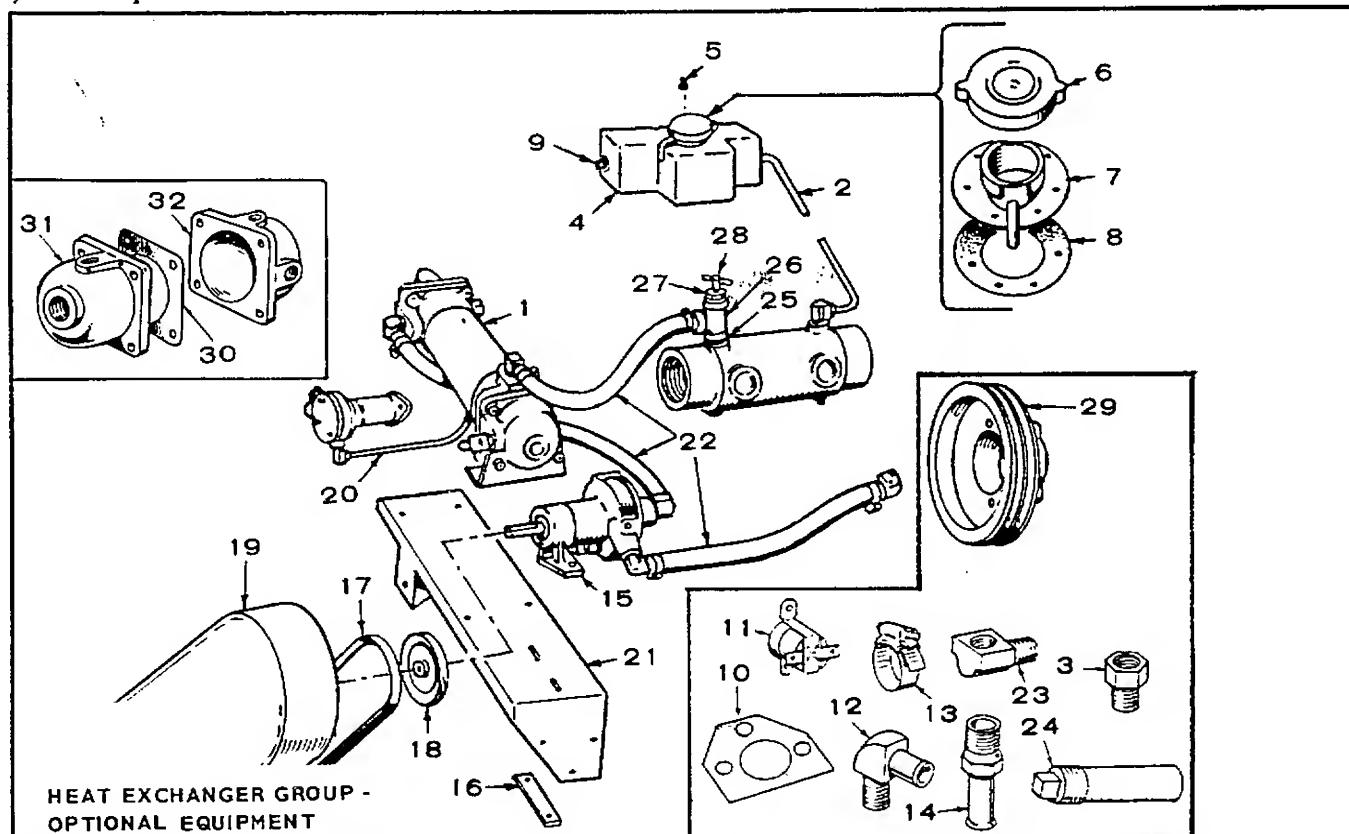


## **SPECIAL PARTS FOR KEEL COOLING MODELS - OPTIONAL EQUIPMENT**

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                      |
|----------|----------|-----------|---------------------------------------|
| 1        | 130D692  | 1         | Bracket, Water Pump & Governor Spring |
| 2        | 132C74   | 1         | *Pump, Water - Less Pulley            |
| 3        | 131A144  | 1         | Bar, Pump Hold-down                   |
| 4        | 512P42   | 1         | Pulley, Water Pump                    |
| 5        | 511P68   | 1         | Belt, Water Pump Drive                |
| 7        | 502-250  | 1         | Elbow, Outlet - Brass - Pump          |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION             |
|----------|----------|-----------|------------------------------|
| 9        | 502A278  | 1         | Elbow, Pump Inlet - Brass    |
| 10       | 503P183  | 2         | Clamp, Hose                  |
| 11       | 503-445  | 1         | Hose, Rubber - Pump to Block |
| 21       | 130D591  | 1         | Guard, Belt                  |
| 22       | 104C550  | 1         | Pulley, Flywheel             |

\* - For component parts, refer to separate group.



HEAT EXCHANGER GROUP -  
OPTIONAL EQUIPMENT

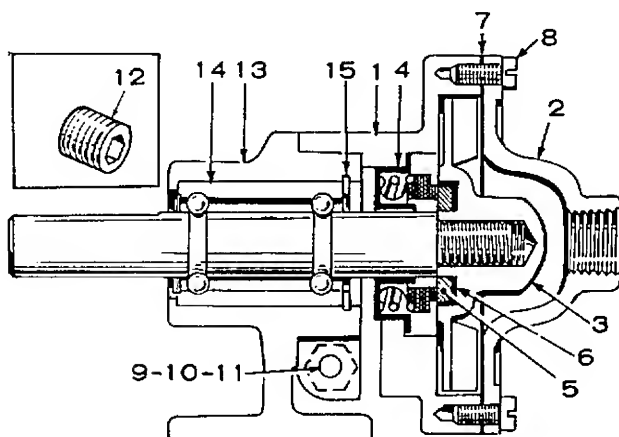
| REF.<br>NO. | PART<br>NO. | QTY.<br>USED | PART<br>DESCRIPTION   |
|-------------|-------------|--------------|---|
| 1           | 130C514     | 1            | Exchanger, Heat (Includes Zinc Pencil Assy.)                              |
| 2           | 130A568     | 1            | Line, Water - Exp. Tank to Exh. Manifold                                  |
| 3           | 502-103     | 1            | Connector, Inv. Male - Exp Tank Outlet                                    |
| 4           | 130D524     | 1            | Tank, Expansion   |
| 5           | 502-80      | 1            | Plug, 1/8" Exp. Tank Fill Vent  |
| 6           | 130A589     | 1            | Cap, Pressure   |
| 7           | 130A590     | 1            | Neck and Adapter, Exp. Tank Cap   |
| 8           | 130A519     | 1            | Gasket, Neck and Adapter  |
| 9           | 502-155     | 1            | Plug, 3/8" - Expansion Tank   |
| 10          | 309A145     | 1            | Gasket, Thermostat Chamber (Also Listed in Manifold and Thermostat Group) |
| 11          | 309A156     | 1            | Switch, Hi - Temp. Cut-Off  |
| 12          | 502-237     | 5            | Elbow, Brass - Rubber Hose Connections                                    |
| 13          | 503-171     | 6            | Clamp, Hose   |
| 14          | 502-238     | 1            | Nipple Brass-Manifold Outlet Hose Connection                              |
| 15          | 132B110     | 1            | *Pump, Less Pulley  |
| 16          | 131A130     | 1            | Bar, Pump Hold-down   |
| 17          | 511P67      | 1            | Belt, Centrifugal Water Pump  |
| 18          | 512P42      | 1            | Pulley, Centrifugal Water Pump  |

| REF.<br>NO. | PART<br>NO. | QTY.<br>USED | PART<br>DESCRIPTION   |
|-------------|-------------|--------------|---|
| 19          | 130D591     | 1            | Guard, Belt   |
| 20          | 130A627     | 1            | Line, Water - to Heat Exchanger   |
| 21          | 130D692     | 1            | Bracket, Heat Exchanger and Governor Spring Bracket                                 |
| 22          | 503-159     | 1            | Hose, Rubber (1/2" I.D. x 34" Total Length Required for all Hoses)                  |
| 23          | 502-74      | 1            | Elbow, Inv. Male-Manifold Line Inlet (Also Listed in Manifold and Thermostat Group) |
| 24          | 130A626     | 1            | Pencil Assy., Zinc  |
| 25          | 502-85      | 1            | Nipple, Close (3/8") - Manifold Outlet  |
| 26          | 502-257     | 1            | Tee, Pipe (3/8") Man.Outlet   |
| 27          | 502-49      | 1            | Bushing, Pipe (1/8 x 3/8) - Manifold Outlet   |
| 28          | 504-6       | 1            | Valve, Air Bleed-Man. Outlet  |
| 29          | 104B550     | 1            | Pully, Flywheel   |
| 30          | 130P726     | 2            | Gasket, End Bonnet-Ht. Exch.  |
| 31          | 130P728     | 1            | Bonnet, Ht. Exch. - Raw Water   |
| 32          | 130P727     | 1            | Bonnet, Ht. Exch. - Fresh Water   |

\* - For component parts, refer to separate group.

# WATER PUMP PARTS GROUP (132B110)

NOTE: This pump used on plants with heat exchanger only.



| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                    |
|----------|----------|-----------|-------------------------------------|
|          | 132B110  | 1         | Pump, Water - Complete              |
|          | 132K111  | 1         | Repair Kit, Includes Parts Marked * |
| 1        |          | 1         | Body, Pump - Oberdorfer #C-6475     |
| 2        |          | 1         | Cover, Pump - Oberdorfer #B-6483    |
| 3        | 132-114  | 1         | *Impeller                           |
| 4        | 132P101  | 1         | *Seal                               |
| 5        | 132P91   | 1         | *Face, Wear                         |
| 6        | 132P92   | 1         | *Seat, Seal                         |
| 7        | 132-112  | 1         | *Gasket, Cover                      |
| 8        | 132-113  | 6         | *Screw, Cover                       |
| 9        |          | 1         | Screw, Cap - Oberdorfer #A-5014     |
| 10       |          | 1         | Lockwasher, Oberdorfer #A-5016      |
| 11       |          | 1         | Nut, Hex - Oberdorfer #A-5015       |
| 12       |          | 1         | Plug, Drain - Oberdorfer #A-6062    |
| 13       |          | 1         | Pedestal, Oberdorfer #C-6484        |
| 14       | 132-89   | 1         | *Shaft and Bearing Assembly         |
| 15       | 132-132  | 1         | Ring, Snap                          |

\* - Parts included in the 132K111 Repair Kit.

NOTE: Order parts with Onan part numbers from your Onan dealer. Order parts that do not have an Onan number from Oberdorfer Foundries, Pump Division, Syracuse, New York.

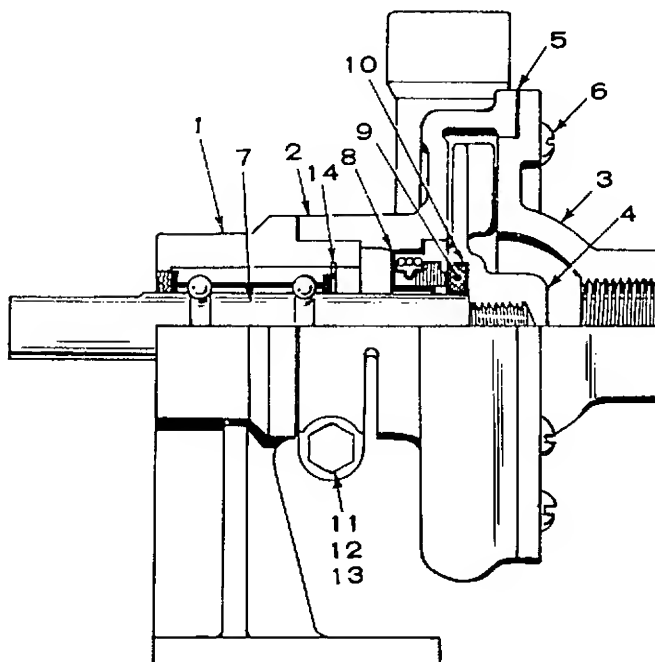
# WATER PUMP PARTS GROUP (132C74)

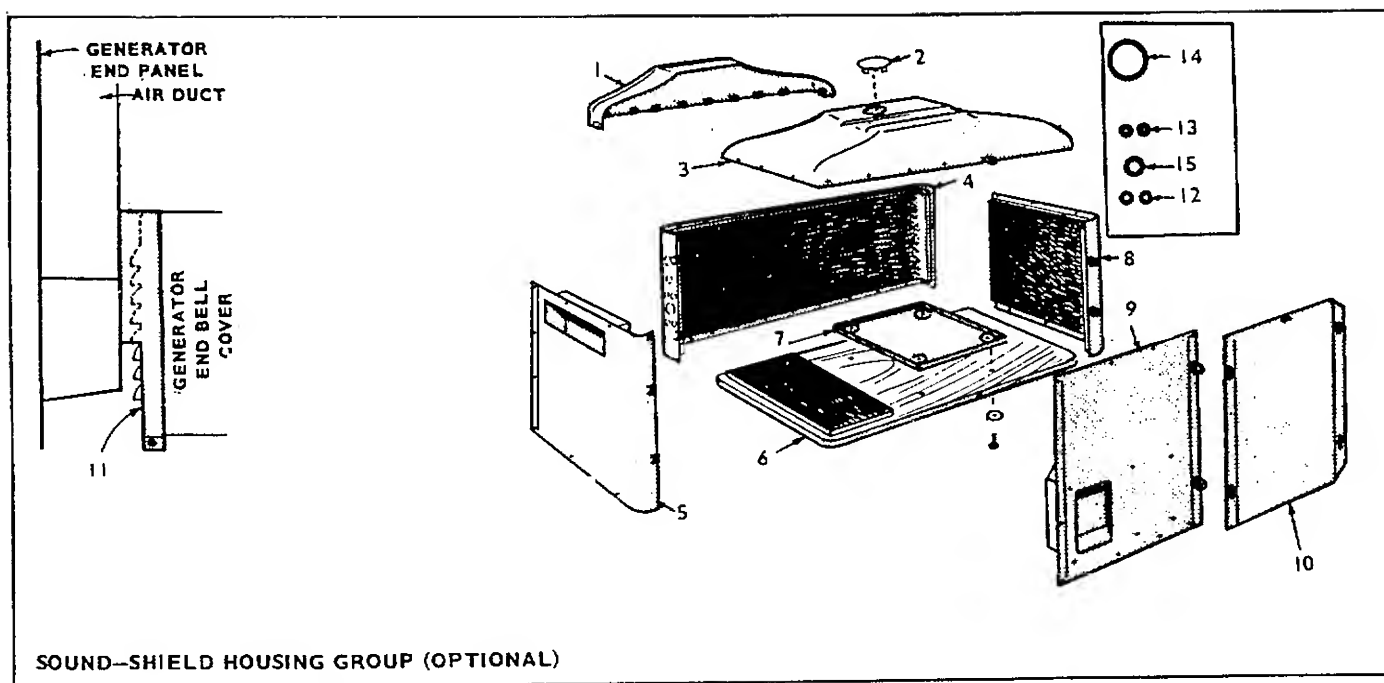
NOTE: This pump used on plants with keel cooling only.

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                    |
|----------|----------|-----------|-------------------------------------|
|          | 132C74   | 1         | Pump, Water - Complete              |
|          | 132K93   | 1         | Repair Kit, Includes Parts Marked * |
| 1        |          | 1         | Pedestal, Oberdorfer #5215          |
| 2        |          | 1         | Body, Pump - Oberdorfer #5167       |
| 3        |          | 1         | Cover, Pump - Oberdorfer #5168      |
| 4        | 132-87   | 1         | Impeller                            |
| 5        | 132-88   | 1         | *Gasket, Cover                      |
| 6        | 810-99   | 8         | *Screw (#10-24 x 7/16"), Brass      |
| 7        | 132-89   | 1         | *Shaft and Bearing Assy.            |
| 8        | 132P101  | 1         | *Seal, Mechanical                   |
| 9        | 132P91   | 1         | *Ring, Seal Wear                    |
| 10       | 132P92   | 1         | *Cap, Wear Ring                     |
| 11       |          | 1         | Screw, Cap - Oberdorfer #5014       |
| 12       |          | 1         | Nut, Oberdorfer #5015               |
| 13       |          | 1         | Lockwasher, Oberdorfer #5016        |
| 14       |          | 1         | Ring, Snap - Eaton #738             |

\* - Included in the 132K93 Repair Kit.

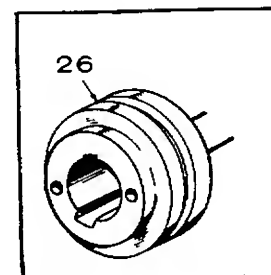
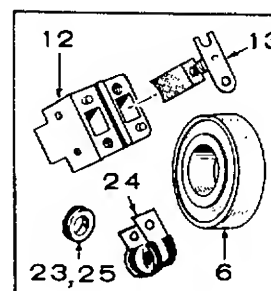
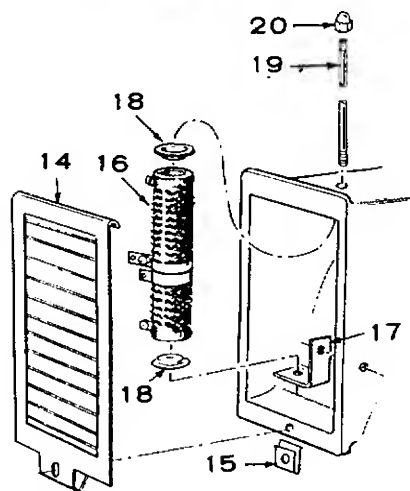
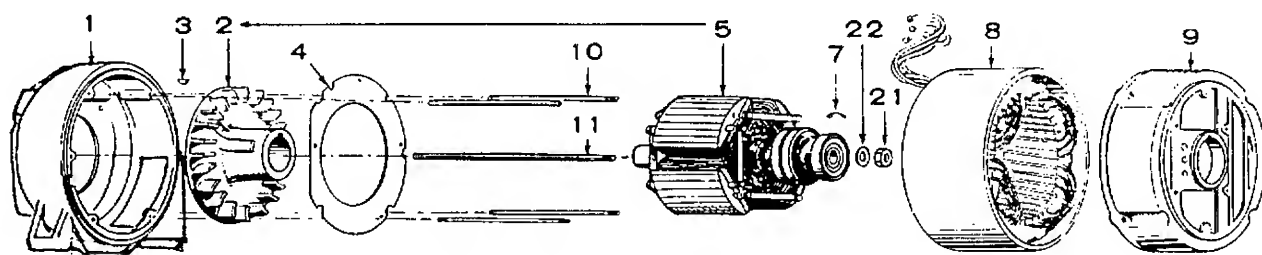
NOTE: Order parts with Onan part numbers from your Onan dealer. Order parts that do not have an Onan number from Oberdorfer Foundries, Pump Division, Syracuse, New York.





| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                                |
|----------|----------|-----------|---|
| 1        | 405B1471 | 1         | Molding, Corner (Insulated)                     |
| 2        | 405B1478 | 1         | Plate, Cover                                    |
| 3        | 405C1474 | 1         | Panel, Top (Insulated)                          |
| 4        | 405B1468 | 1         | Panel, Back (Insulated)                         |
| 5        | 405B1446 | 1         | Panel, Gen. End - Incl. Inlet Duct (Insulated)  |
| 6        | 405B1480 | 1         | Base, Mounting (Insulated)                      |
| 7        | 405B1431 | 1         | Pan, Drip                                       |
| 8        | 405C1454 | 1         | Panel, Engine End (Insulated)                   |
| 9        | 405B1466 | 1         | Panel, Door - Incl. Air Outlet Duct (Insulated) |

| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                               |
|----------|----------|-----------|--|
| 10       | 405C1456 | 1         | Panel, Access (Insulated)                      |
| 11       | 405B1536 | 1         | Band, Duct Adapter                             |
| 12       | 508P8    | 2         | Grommet, Fuel Inlet & Return (For 13/16" Hole) |
| 13       | 508P71   | 2         | Grommet, Battery Leads (For 7/8" Hole)         |
| 14       | 508P115  | 1         | Grommet, Exhaust (For 2-1/2" Hole)             |
| 15       | 508P4    | 2         | Grommet, Water Inlet & Leads (For 1-3/8" Hole) |



GENERATOR GROUP - ALTERNATOR PORTION

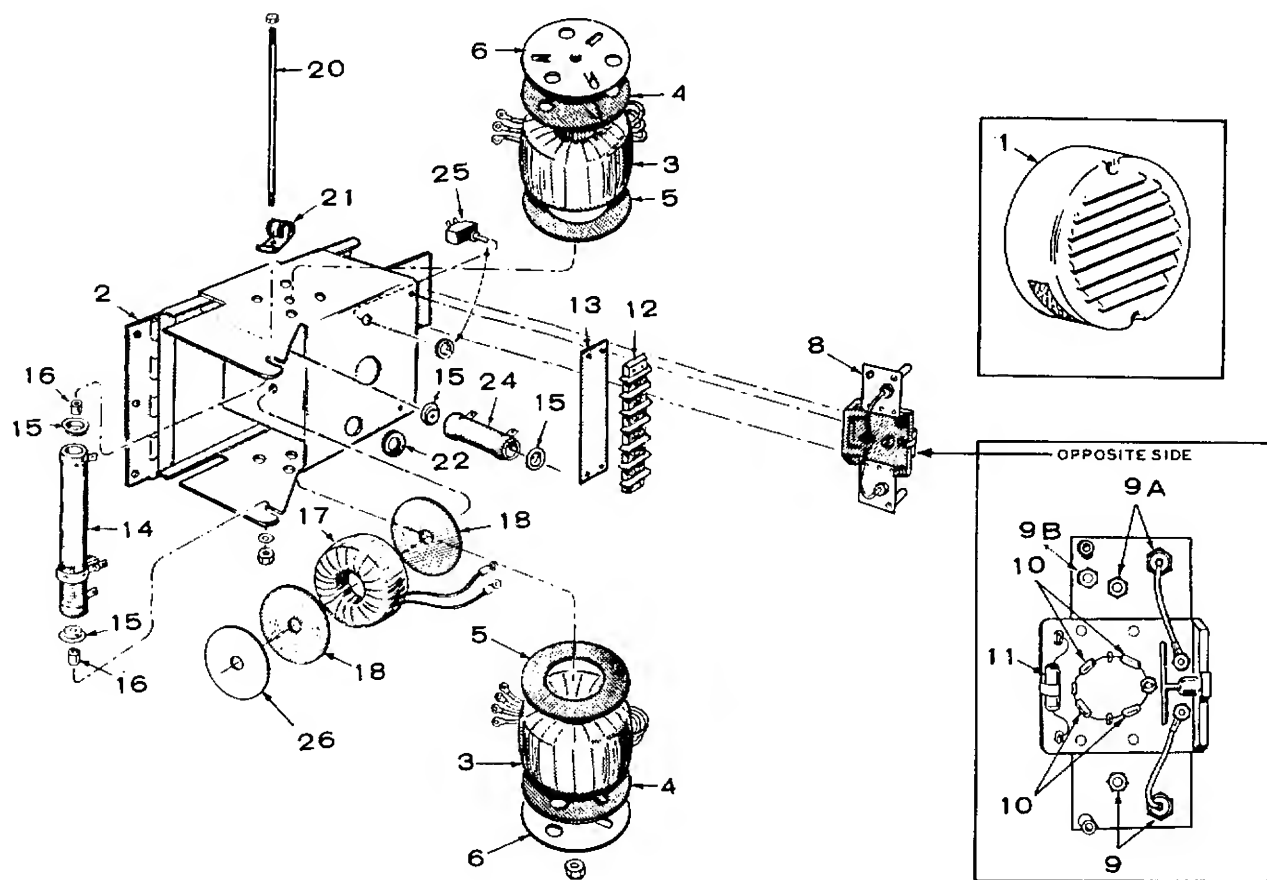
| REF. NO. | PART NO. | QTY. USED | PART DESCRIPTION                   |
|----------|----------|-----------|------------------------------------|
| 1        | 231E112  | 1         | Adapter, Generator to Engine       |
| 2        | 205C64   | 1         | Blower, Generator                  |
| 3        | 515-6    | 1         | Key, Blower to Crankshaft          |
| 4        | 234B162  | 1         | Baffle, Generator Air              |
| 5        | 201A1120 | 1         | Rotor, Wound - Incl. Brg. & Blower |
| 6        | 510A47   | 1         | Bearing, Ball - Rotor              |
| 7        | 232A596  | 1         | Clip, Bearing Stop                 |
| 8        | *        | 1         | Stator Assembly, Wound             |
| 9        | 211E146  | 1         | Bell, End - Alternator to Exciter  |
| 10       | 520A636  | 4         | Stud, Generator Through            |
| 11       | 520A612  | 1         | Stud, Rotor Through                |
| 12       | 212A1064 | 2         | Block, Guide - Collector Ring      |
| 13       | 214A59   | 4         | Brush, Collector Ring              |
| 14       | 234B172  | 1         | Cover, Air Outlet                  |
| 15       | 870-177  | 1         | Clip, Fastening                    |

| REF. NO. | PART NO.   | QTY. USED | PART DESCRIPTION             |
|----------|--|-----------|------------------------------|
| 16       | RESISTOR, TAPPED ADJ. (ALSO LISTED IN CONTROL GROUP) |           |                              |
|          | 304A500  | 1         | Key 1                        |
|          | 304A534  | 1         | Key 2                        |
| 17       | 232A1565   | 1         | Bracket, Resistor Mtg.       |
| 18       | 304A6  | 2         | Washer, Resistor Centering   |
| 19       | 520A620  | 1         | Stud, Resistor Mtg.          |
| 20       | 866-1  | 1         | Nut, Acorn - Resistor Mtg.   |
| 21       | 870P203  | 1         | Nut, Rotor through Stud      |
| 22       | 232A200  | 1         | Washer, Rotor through Stud   |
| 23       | 508P95   | 1         | Grommet, Rubber - Air Baffle |
| 24       | 332-50   | 1         | Clip, Tinnerman              |
| 25       | 508B112  | 1         | Grommet, Rubber - Lead Out   |
| 26       | 204A61   | 1         | Collector Ring               |

\* - Order by description giving Model, Spec and Serial Number.



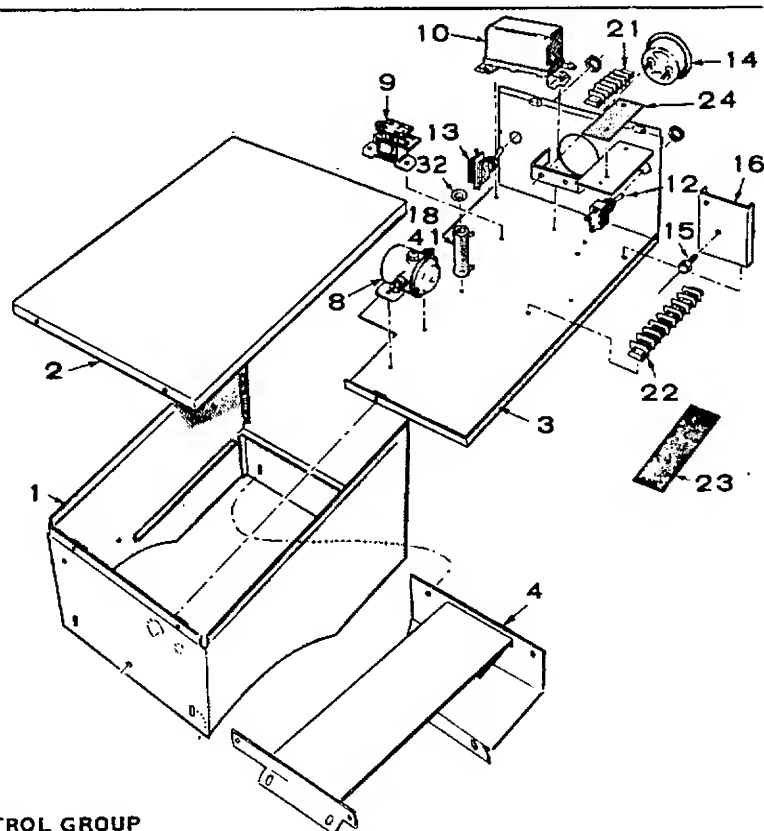
# GENERATOR GROUP - EXCITER PORTION



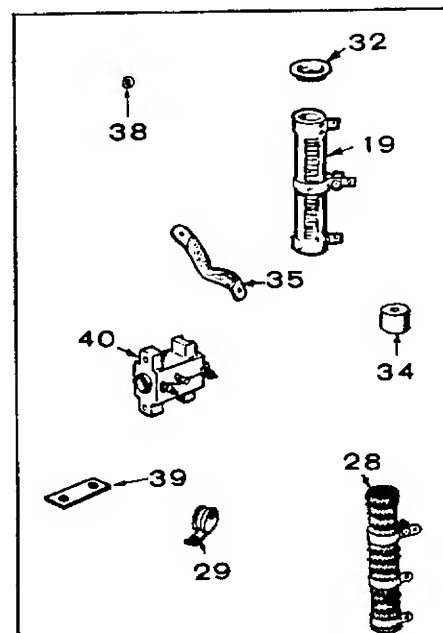
**NOTE:** All 6.0MDJE Plants used 06SX5IN3B (except 6.0MDJE - 55DR used 06SX5IN1B). 7.5MDJE Plants used 04SXIN3B (except 7.5MDJE - 5DR used 04SXIN1B).

Check your plant nameplate for correct magneciter number. Select the correct Part Number column that applies to your plant.

| REF. NO. | QTY. USED | PART DESCRIPTION   | PART NUMBER |          |           |           |
|----------|-----------|--|-------------|----------|-----------|-----------|
|          |           |  | 04SXIN1B    | 04SXIN3B | 06SX5IN1B | 06SX5IN3B |
|          | 1         | Exciter Complete (Less Cover)                            | 209-3       | 209-5    | 209-12    | 209-13    |
| 1        | 1         | Cover, Exciter   | 234B185     | 234B185  | 234D185   | 234D185   |
| 2        | 1         | Panel Only, Exciter                                      | 234B188     | 234B188  | 234B188   | 234B188   |
| 3        | 2         | Reactor, Gate  | 315A99      | 315A99   | 315B104   | 315B104   |
| 4        | 2         | Gasket, Gate Reactor Mounting, Outer                     | 232A1553    | 232A1553 | 232A1553  | 232A1553  |
| 5        | 2         | Gasket, Gate Reactor Mounting, Inner                     | 232A1551    | 232A1551 | 232A1551  | 232A1551  |
| 6        | 2         | Retainer, Gate Reactor                                   | 232A1552    | 232A1552 | 232A1552  | 232A1552  |
| 8        | 1         | Rectifier Assy., Resistor and Complete                   | 305C259     | 305C387  | 305C264   | 305C388   |
| 9        | 2         | Rectifier Only, Power Field, Negative                    | 305P238     | 305P238  | 305P238   | 305P238   |
| 9A       | 2         | Rectifier Only, Power Field, Positive                    | 305P239     | 305P239  | 305P239   | 305P239   |
| 9B       | 1         | Rectifier, Field Flash                                   |             | 305P239  |           | 305P239   |
| 10       | 4         | Rectifier, Voltage Control                               | 305P240     | 305P240  | 305P240   | 305P240   |
| 11       | 1         | Resistor, Included in Rectifier Assy. (150-Ohm, 50-Watt) |             |          | 304A512   | 304A512   |
| 11       | 1         | Resistor, Incl. in Rectifier Assy. (500-Ohm, 5-Watt)     | 304P476     | 304P476  |           |           |
| 12       | 1         | Block, Terminal  | 332A745     | 332A745  | 332A745   | 332A745   |
| 13       | 1         | Strip, Block Marker                                      | 332A746     | 332A925  | 332A746   | 332A925   |
| 14       | 1         | Resistor, Tapped, 500-Ohm (425 Fixed, 75 Adj.)           | 304A527     | 304A527  | 304A527   | 304A527   |
| 15       | 4         | Washer, Resistor Centering                               | 304A15      | 304A15   | 304A15    | 304A15    |
| 16       | 2         | Spacer, Resistor Mounting                                | 232A1474    | 232A1474 | 232A1474  | 232A1474  |
| 17       | 1         | Reactor, Voltage Control                                 | 315A100     | 315A100  | 315A105   | 315A105   |
| 18       | 2         | Gasket, Voltage Control Reactor                          | 232A1548    | 232A1548 | 232A1548  | 232A1548  |
| 20       | 1         | Stud (or Screw), Tapped Resistor Mounting                | 520A641     | 520A641  | 520A641   | 520A641   |
| 21       | 1         | Clip, Tinnerman  | 332-51      | 332-51   | 332-51    | 332-51    |
| 22       | 1         | Grommet, Rubber, For 7/8" Hole                           | 508P8       | 508P8    | 508P8     | 508P8     |
| 24       | 1         | Resistor, Fixed (250-Ohm, 25-Watt)                       | 304A510     | 304A510  | 304A510   | 304A510   |
| 25       | 1         | Switch, Residual Reset                                   | 308A175     |          | 308A175   |           |
| 26       | 1         | Washer, Retainer, Voltage Control Reactor                | 526-173     | 526-173  | 526-173   | 526-173   |



CONTROL GROUP



| REF. NO. | PART NO.                            | QTY. USED | PART DESCRIPTION   |
|----------|-------------------------------------|-----------|--|
| 1        | 301C1962                            | 1         | Box, Control   |
| 2        | 301B1963                            | 1         | Cover, Control Box   |
| 3        | 301D1961                            | 1         | Panel, Control Box   |
| 4        | 301C1968                            | 1         | Bracket, Control Box   |
| 8        | SOLENOID, MANIFOLD HEATER AND START |           |  |
|          | 307B1046                            | 2         | Key 1  |
|          | 307B61                              | 2         | Key 2  |
| 9        | 307B623                             | 1         | Relay, Start Disconnect  |
| 10       | 307B597                             | 1         | Relay, Ignition Start  |
| 12       | 308A154                             | 1         | Switch, Start-Stop   |
| 13       | 308-37                              | 1         | Switch, Manifold Heater  |
| 14       | 302A446                             | 1         | Ammeter, Charge (5-0-5)  |
| 15       | RECTIFIER - 10-AMP, 100-VOLT PEAK   |           |  |
|          | 305A235                             | 1         | Key 1  |
|          | 305P238                             | 1         | Key 2  |
| 16       | 305A254                             | 1         | Bracket, Rectifier   |
| 18       | 304A32                              | 1         | Resistor, Fixed - Key 1  |
| 19       | RESISTOR, ADJUSTABLE                |           |  |
|          | 304A5                               | 1         | Key 2 (150-Ohm, 25-Watt) 9/16 x 2"   |
|          | 304A247                             | 1         | Key 2 (100-Ohm, 10-Watt) 5/16 x 1-3/4"                                       |
|          | BLOCK TERMINAL                      |           |  |
| 21       | 332A604                             | 1         | Key 1, 2 (5-Place)   |
| 22       | 332A706                             | 1         | All (8-Place)  |
| 23       | 332A739                             | 1         | Strip, Block Mkr. (4,5,6,7,8,9)  |
| 24       | 332A616                             | 1         | Strip, Block Marker Marked B+, 1,2,3,H - Remote Connections (4 to 5 - Place) |

| REF. NO. | PART NO.  | QTY. USED | PART DESCRIPTION   |
|----------|---|-----------|--|
| 28       | RESISTOR, TAPPED ADJ. (MTS. IN GENERATOR AIR OUTLET)                        |           |  |
|          | 304A500   | 1         | Key 1  |
|          | 304A534   | 2         | Key 2  |
| 29       | 332P52  | 1         | Clip, Tinnerman  |
| 32       | 304A6   | 2         | Washer, Resistor Centering   |
| 34       | 402-78  | 4         | Mount, Rubber - Control Box  |
| 35       | 337A52  | 1         | Strap, Ground - Control Box to Generator                           |
| 38       | 508-1   | 1         | Grommet, Rubber - For 1 - 1/16" Hole                               |
| 39       | 332A602   | 1         | Jumper, Heater Sol. to Start Sol.                                  |
| 40       | 320A104   | 1         | Switch, Emergency Reset - Plts. with Low Oil Press. Cut-Off Switch |
| 41       | RESISTOR, FIXED (1-OHM, 10-WATT) - PLTS. WITH LOW OIL PRESS. CUT-OFF SWITCH |           |  |
|          | 304A217   | 1         | Key 1  |
|          | 304A3   | 1         | Key 2  |

#### SERVICE KITS AND MISCELLANEOUS

NOTE: For other kits, refer to the group for the part in question.

|                      |   |  |
|----------------------|---|--|
| 98C1807              | 1 | Decal Kit  |
| 168K106              | 1 | Gasket Kit, Plant  |
| OVERHAUL KIT, ENGINE |   |  |
| 522K241              | 1 | Prior to Spec B  |
| 522K257              | 1 | Begin Spec B   |
| 525P216              | 1 | Paint, Touch-up (pressurized can) 16 ounce - Marine White Enamel |